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DATA NEWS

ICC Unveils CRT; Challenges Bell

By Ronald A. Frank
Of the CW Staff

NEW YORK – International Communications Corp. (ICC) has introduced an interactive CRT terminal system that is plug-compatible with the Bell System's Dataspeed 40.

Called the 40+ data display system, the terminal is designed as a user alternative to the Dataspeed 40 offering additional features at a comparable price.

Most noticeable among the additional features is the capability of the 40+ to transmit at 2,400 bit/sec in synchronous mode, while the Dataspeed 40 is presently limited to 1,200 bit/sec asynchronous operation. The 40+ contains a "firmware programmable microprocessor" with up to 8K of RAM and up to 8K of ROM. The first systems will use an Intel 8008 microprocessor but comparable circuitry could be used, a spokesman said.

The ICC terminal can operate on dial-up or private lines at half- or full-duplex mode with asynchronous (1,200 bit/sec) or synchronous transmission. A later version will be able to handle a bipolar signal which will be used with AT&T's Dataphone Digital Service (DDS), and future models will also be compatible with SDLC terminal systems from IBM, according to an ICC spokesman.

Among the features available with the 40+ that are not offered by AT&T are an underline mode, a line erase (instead of a character erase) key and a word insert and delete capability.

The displays are similar in that both have buffer storage to handle three pages or segments of 1,920 characters which can be scrolled as required by the operator. One feature of the Dataspeed 40 not available on the ICC unit is a transmission speed of 1,050 bit/sec.

But generally the 40+ is a direct replacement for the Bell display. Both use an Ascii character set and are RS 232-compatible, which ICC said simplifies the attachment of a variety of printers. At the 40+ announcement here, the com-

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On the Inside This Week

Takes 14 Privacy 'Initiatives'

Ford Council Pushes Federal Regulation

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – "Tough" new privacy legislation covering federal agencies and the filing of "privacy impact statements" are two of the more dramatic proposals to come out of last week's meeting of the Domestic Council Committee on the Right of Privacy headed by Vice President Gerald Ford.

In all, the council, which is made up of high-level personnel from 10 government agencies, approved 14 staff-prepared initiatives at its first full meeting on proposals since being established by President Richard M. Nixon in a radio address to the nation on Feb. 23.

The meeting last week, which lasted "a couple of hours" with "good" attendance from the 10 agencies, concentrated most attention on federal data banks, with only two major proposals in the area of computerized data banks in the private sector.

Under the first of these initiatives, the council recommended that the Office of Consumer Affairs in the White House develop a "Declaration of Consumer Rights to Privacy" with regard to private businesses.

Under this idea, businesses would be asked to voluntarily subscribe to a code of fair information practices, reflecting the council's feelings that business should be asked for voluntary compliance before legislation is sought requiring such compliance.

The consumer agency was given until Aug. 1 to come up with its proposals in this area. The idea, a council source said, has been "pretested" in the business community during initial studies and would receive further testing before implementation is attempted on a wide basis.

Credit Act Extended

The second proposal that would seriously affect the private sector deals with recommendations to strengthen the Fair Credit Reporting Act, which regulates private credit data banks.

In this area, the council, while not endorsing any specific legislation, endorsed the principles that a person should know of any such file on him, that he should have access to that file and the right to challenge its accuracy, that a person should be notified any time an adverse action was taken about him as the result of such a file, that a person must authorize any investigative report about him in writing before it is done, and that a person should authorize in writing the collection of any potentially sensitive medical data about him.

In the federal area the initiatives were more far-reaching.

First, the council endorsed the idea of requiring "privacy impact statements" for present and future data banks that contain personal information, even though it felt a new name should be developed for such statements, temporarily calling them "privacy control documents."

Under this regulation, each agency wanting to establish a computer-based data bank that contained personal information would have to tell the Office of Management and Budget and the Office of Telecommunications Policy of such intentions in the early planning stages.

Then before system design or procurement of any equipment for such a system, the agency would have to submit a statement of the potential problems in the privacy area for public review and comment.

Finally, each agency which did in fact establish such a system would have to pass a compliance test to determine if the

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Third-Party Deal Canceled On Eve of 158 Delivery

By a CW Staff Writer

OMAHA, Neb. A prospective IBM 370/158 user here was left in the lurch recently when his third-party leasing firm notified him it could not fulfill its commitment to supply the system on a lease/purchase plan just two weeks before the scheduled installation.

The user, who did not want his name mentioned, had ordered the 158 under the Itel Investors' Group Two plan, but the firm notified him two weeks short of the installation date that the plan had not been approved by the Securities and Exchange Commission (SEC).

The problem is not limited to this area, since another user in Akron, Ohio, who had previously leased from Itel, was told the firm could not supply him with a new system this year under the plan.

Both users are now leasing their systems from IBM under its lease term plan.

And the problem may affect many more users since Itel is aggressively selling users to sign up for Package Operating Leases that are offered under the plan, even though the plan has yet to be approved.

'Out in Left Field'

The news that Itel could not pay for the 370 under the plan left the user here "out in left field," he said, even though Itel salesmen had warned him "there was a small possibility it would not be able to get the money" if the plan was not approved.

The salesmen had said that since a similar plan was approved a year ago, it should work out this year too, the user reported.

Under the plan, Itel offers users two- or three-year leases on IBM equipment at rates up to 40% under those offered by

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City, State DP Acquisitions Under Fire

Taxpayers File Suit For Misuse of Funds

By Vic Farmer
Of the CW Staff

CONCORD, Calif. – The school district here replaced its leased IBM 1401 with a purchased 370/125 earlier this year over a series of citizen objections calling for an independent evaluation and feasibility study of the upgrade.

But two taxpayers have now filed a class-action suit against the district alleging that the school district trustees misused bond money to finance the purchase of the computer, and the $565,229 deal is in jeopardy.

The pair, Jerry L. Smith and Lynden Siple, is also seeking a preliminary injunction against the school district trustees to halt the district from fulfilling the balance of the contract using bond issue funds or other school money. A hearing on this preliminary injunction is set for Aug. 6.

Although the suit names the school district trustees and school supervisor specifically as defendants, IBM is named as a "real party in interest" and, if the taxpayers are successful, IBM will have to take back the 370/125 and return the district's money, the suit said.

The complaint also alleges that the Board of Education didn't determine it was in the best interest of the school district to replace the existing DP equipment before calling for bids as required by the Education Code.

Removed IBM's Name

Lawyer for the plaintiffs, Stuart A. Safine, has charged that the preliminary requisition was a specific description of an IBM 370/125 and the final requisition merely eliminated IBM's name but kept the equipment descriptions intact.

The complaint alleges this tactic prevented open competitive bidding from

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Texas Officials Rap 370 Purchase Plan

AUSTIN, Texas – The Texas Department of Public Welfare had its heart set on buying a new $2.2 million IBM 370/158 computer to replace its IBM-leased 370/155 early this spring, but a campaign launched by a 32-year-old freshman state representative and a member of the state auditor's office may have blown the deal apart.

The deal hinged on a "no-substitute" requisition drawn up in April by the welfare department for a 158. It happened that a 158 was in Austin at the time; the University of Texas had ordered the machine but canceled after the computer had been shipped, according to department officials.

Orus M. Mooney, then director of the systems and administrative services divi-

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Potential Abuse Seen in Health Bills

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Proposed national health care bills would seriously jeopardize individual privacy and permit the development of a national health data bank, Rep. Edward I. Koch (D-N.Y.) testified here recently.

Koch criticized the Mills-Kennedy Bill saying it would authorize the transfer of "any information on family status or family income" from state agencies to the Federal Government without the family's knowledge.

He also told the House Ways and Means Committee the bill would allow the government "to enter into contracts with private organizations to obtain family status and family income data.

"Under no circumstances should your committee permit the unbridled transfer of such information – particularly without the written, informed consent of the individual – unless it is a case of medical emergency," he said.

"Even then, the most stringent regulations" should be applied, Koch added.

Koch explained that "the individual has the right to know the uses to which the information he submits will be put and how it will be disseminated and how its release or nonrelease will affect his eligibility for benefits."

He emphasized the need to protect health care information, noting that "during processing for payment by insurance companies, health care information should be protected from falling into the hands of an individual's employer. He called for "safeguards to protect the privacy of an individual during any examination of his medical record under the guise of "program evaluation, audit or cost justification."

In addition, Koch said an individual should be able to "inspect his own file, obtain a reasonably inexpensive copy and, when necessary, supplement the information" it contains.

The individual should be permitted to remove erroneous or irrelevant information and should be assured that agencies and persons to whom that erroneous information was given are notified of its removal.

As for the proposed health care credit card, Koch explained that the same qualities that make the card attractive to health planners make it dangerous to him.

"The ease of use and efficiency of the card could lead to abuse and illegal access to information" by other organizations with an individual's card number – especially if the Social Security Number is used as the individual's identifier.

"If the Social Security Administration is chosen to administer the national health program, and if Congress authorizes the use of the Social Security Number as the health card number, the way will have been paved toward abusing the Social Security Number as the universal numerical identifier," Koch predicted.

As a further protection of collected data, "only those who need to examine the files in connection with performance of their duties should have access to medical files," Koch said, and a record of all who do access the files should be maintained.

Ford Council Pushes Federal Regulation

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system met the standards that would be established for such systems and the goals outlined in the impact statements, even though the council was not clear last week over who would administer such tests.

The group also established a policy position that would require all existing federal data banks to pass similar compliance tests to make sure that all personal information already collected would be protected under any standards that were drawn up.

Accelerate NBS Efforts

In line with this, the council recommended the National Bureau of Standards accelerate development of standards for safeguarding the security and confidentiality of personal information in data systems.

The council established a board to work with the NBS in this area, including representatives of the federal agencies on the council, the National Association of State Information Systems and others to be asked to join later. The board would give the effort "visibility" and provide NBS with "broad-scale input," one council source said.

It also recommended NBS funding be increased in this area to speed up its work by several years.

The council also endorsed the concepts in a proposed substitute for the Koch-Goldwater bill [CW, April 17]. The alternative legislation embraces many of the Koch-Goldwater concepts on a personal bill of rights with regard to computerized data banks, but is limited to the federal arena.

The proposed bill, which is currently the subject of discussions between the Office of Management and Budget and congressional committee staffers, will probably be made public later this month and might possibly receive congressional approval this year, council sources said.

"It is just as broad and sweeping as Koch-Goldwater," the source said, even though it is limited to federal agencies only and does not apply to state and local data banks or those in the private sector.

Banking Studies

In another major action, the council recommended agencies concerned with banking and retailing should undertake specific studies of the privacy implications of electronic funds transfer and point-of-sale systems.

In the banking area, the council suggested the Federal Reserve Board or the Federal Home Loan Bank Board could head such studies, even while the Department of Commerce and the Treasury Department might conduct similar studies. In addition, the council noted the Office of Telecommunications Policy was currently commissioning a study in this area.

Another recommendation of the council would require the Office of Management and Budget to issue regulations ordering every executive agency to establish procedures for informing people whether they have to answer questions of a personal nature about themselves or others.

This would be much like a "Miranda" warning, which must be given to criminal suspects telling them their rights to remain silent and to counsel, except that it would warn people when they did not have to provide government agencies with personal information if they did not wish to.

As another initiative, the council endorsed the idea that students and/or their parents should have a right to inspect educational records kept on them and that access to such records should be strictly limited by law.

In other major actions taken at last week's meeting the council:

- Endorsed the idea of a federal employees bill of rights to privacy that could be accomplished either through legislation or through executive order by the President. The Civil Service Administration has assured the council it could come up with proposals in this area within two weeks.
- Supported the idea that no bank records on an individual should be given out to anyone else without a subpoena or court order and that the individual whose records are being disbursed under such orders should be notified that it is being done.
- Recommended support for a bill that would prohibit military spying on civilian activities, although it would not support the bill proposed by Sen. Sam Ervin (D-N.C.) in its present form (S 2318).
- Endorsed the idea contained in a present CATV bill that cable television companies should be prohibited from giving out any information on subscribers.
- Recommended all federal agencies redesign their forms for collecting personal information to include a check-off box individuals could use to prevent their names from being sold for mailing list purposes. In addition, it recommended study of possible legislation that could go as far as banning the sale of such lists by federal agencies.
- Endorsed present Internal Revenue Service plans to develop stronger, more comprehensive legislation to protect taxpayer records. IRS, council sources noted, is expected to report a draft of proposed legislation within two weeks.

Council members noted all of the "Initiatives" adopted at last week's meeting were just that and could not be construed as official Nixon Administration policy until the President approves them.

Vice President Ford is expected to transmit the proposals to the President in the next few days for review and possible endorsement.

Several Issues Still Unresolved

WASHINGTON, D.C. – The Domestic Council Committee on the Right of Privacy left several studies hanging last week while proposing new areas for study to be taken up before its next meeting this September.

The most important issue left unresolved at the meeting dealt with the issue of the protection of and right to privacy in criminal justice records, particularly computerized criminal histories.

The council staff felt the situation at present was "too fluid" in this area for the group to take a definitive position on any of the proposals currently being debated in Congress.

However, staffers noted the council was watching the actions of Sen. Sam Ervin (D-N.C.) in hearings on the bill and was encouraging negotiations between Ervin and the Department of Justice over a possible compromise measure.

Other carryover projects include a study the council staff is making on the use of the Social Security Number as a personal identifier and possible new legislation regarding the privacy aspects of personal data in research and statistical systems.

Besides the leftover projects, the council set up several new areas of study.

The Department of Health, Education and Welfare will take the lead in studies on the handling of health and welfare records.

The Labor Department will take the lead in future studies on the handling of employment records by government and industry, while it has not been decided which agencies will take the lead in determining new policies for protecting the privacy of information contained in government background checks.

The fifth major new area of study will be on methods to cut down the actual collection of personal information.

With 'Frivolous' Motions in Antitrust Case

Justice Lawyers Claim IBM 'Harassing' Government

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – Department of Justice lawyers last week accused IBM of filing "frivolous" motions designed solely to harass the government in preparation of its massive antitrust suit against the firm.

The government lawyers, lead by Raymond Carlson, indicated the department had been kept busy during June almost solely in answering the more than 30 motions IBM has filed that have still not been resolved.

For example, Carlson said one IBM motion – accusing the government of giving out information that should have been kept secret – was "harassment pure and simple" and that a second – accusing the department of requesting IRS audits of IBM witnesses [CW, July 3] – was a "frivolous, harassing motion."

Carlson indicated no one in the Department of Justice had ever requested such audits of proposed witnesses from IBM and said the motion was completely out of order.

Judge David N. Edelstein, who is hearing the case in U.S. District Court here, seemed to agree with the Justice Department.

Edelstein warned IBM that the charge was a serious one that should not be made lightly. When lead IBM attorney Thomas Barr said he would not pursue the matter, the judge then got him to withdraw the motion completely.

The judge said the motion was being withdrawn "with prejudice" which means IBM cannot bring up the issue in the future.

Must Refine the Issues

On its part, IBM argued that the government must refine the issues that it will bring up during the trial so the firm can prepare its defense.

The IBM attorneys requested that the government define specific market areas it intended to concentrate on and the specific claims the government would make during the trial, which is slated to start on Oct. 7.

Carlson, for the government, indicated the government would begin to refine the issues as soon as it received all the IBM documentation it had requested and as soon as it had time.

It was noted by IBM that the Department of Commerce was still refusing to hand over certain documents that IBM claims are needed for its defense [CW, July 10].

The Department of Justice argued there was still plenty of room for negotiation over the documents and that such negotiations should be pursued between the parties.

The judge set an Aug. 1 date for a hearing on the IBM motion to force the Department of Commerce to turn over the documents or hold the government in contempt for its refusal to do so and to ultimately dismiss the case if the department continues to refuse to release the information.

Taxpayers File Suit For Misuse of Funds

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other responsible bidders as required by state law.

In addition, the plaintiffs allege the school superintendent did not have the power to make a binding contract and the contract had not been approved or ratified. The pair also alleges the award did not go to the lowest responsible bidder.

The computer was ordered Jan. 29, 1974 and was installed 10 days later. Other companies projected 180-day to six-month delivery dates.

The school district presently owes IBM over $38,000 on the contract but a mutual agreement has temporarily halted the transfer of this amount pending results of the preliminary injunction hearing.

James Merrihew, school superintendent, has publicly stated each vendor bidding on the computer could have met the specifications and that the IBM bid was the lowest bid to meet specifications. Burroughs, Honeywell and Univac also submitted bids.

The school trustees maintain the upgrade to the 125 was needed because of new state data reporting requirements as well as anticipated future requirements, but these claims have been disputed by taxpayers at school district meetings.

Purchase Plan Rapped

(Continued from Page 1)

sion of the state auditor's office and now retired, protested that the no-substitute requisition violated the intent of both state and federal statutes governing such acquisitions without adequate justification.

Mooney then suggested an alternative plan under which the state could capitalize on accrued rental credit from the 155 and add a dynamic address translation (DAT) box, additional memory and peripherals from other companies to get comparable capabilities to the 158 but save $750,000 in the process.

Taking up the banner in the state legislature, Rep. Larry Vick (R-Houston) advocated the state should stop buying separate computers for each agency and create a more efficient central computer system that could be used 24 hours a day.

Vick also referenced documents made public in the IBM/Telex suit that indicated the 158 will be obsolete in 1976 when IBM's new series is due. Vick also stressed the need for open bidding.

Despite this storm of criticism, the State Board of Control decided it did not have a legal right to block a restricted bid if any agency demanded particular equipment.

So the requisition was sent out and bids came in – and, according to Vick, IBM was underbid by a third-party leasing company, reportedly Itel.

In the meantime, the welfare department agreed to a study by independent third-party DP experts to evaluate Mooney's plan and to come up with a plan to fit the department's computer needs.

The time limit for the welfare department to pick up the third-party 158 bid has just passed, so the department is now evaluating "a short-term lease" while it makes "a long-term study" of its needs.

More Important Role Predicted for DP Auditors

By Marvin Smalheiser
CW West Coast Bureau

CHICAGO – DP auditors are becoming increasingly important and responsible to management, which is still largely alien to data processing operations.

That's the way Howard Friedman, president of the EDP Auditors Association, described the challenge DP auditors face in translating their efforts into wider, more comprehensive roles.

Friedman gave the keynote address at the second annual meeting here of the association and cautioned auditors that fraud is only one aspect of a company's vulnerability, however "explosive" it may be.

"Inadvertent loss presents a greater potential hazard to a company than the prospect of planned fraud," Friedman said.

He urged the use of the computer itself as an audit tool.

"Use it to evaluate files of data. Use it to measure computer performance. Use it to test programs.

"Currently, there is an increasing interest by public accounting firms in the development of audit subsystems within the framework of the application systems of their clients."

While risk assessment is important, it should be coupled with the education of management to opportunities to improve operating systems to maximize return on investment in data processing, Friedman said.

"Because of the significance of that operation, the DP auditor should constantly play the devil's advocate for management, challenge the justification for doing things a certain way and assure that management awareness exists as part of the operational environment."

The auditor, he said, should be involved in new systems or major modifications to existing systems, commenting on aspects of their adequacy.

Regarding DP organization and policy, Friedman said the auditor, if his experience is broad enough, can recommend changes in organization structure to optimize effectiveness.

The interrelationships of key functions such as systems, programming and operations should also be examined, he said.

"The auditor should comment on and make management aware of a most important ingredient in a company operation . . . the user and DP department relationship."

All the functions related to operating the DP center are and should be subject to audit, including data and equipment security, Freidman said.

ICC Terminal Challenges Bell

(Continued from Page 1)

pany demonstrated Oki and Centronics printers but is not offering a print unit right away, a spokesman said.

The 40+ can be used in a multipoint polled network, attended or unattended, while the Bell unit is limited to point-to-point lines. And the ICC display will have an integrated modem incorporated into the terminal in later versions.

Using a "bus structure," ICC will probably add peripherals to the system with the most likely being a batch storage device such as a floppy disk. An IBM binary synchronous compatibility is also being planned.

First deliveries of the ICC display are scheduled for late this year with first quarter 1975 quoted for volume delivery. The basic display with keyboard costs $3,850 compared with $3,200 for a comparable Dataspeed 40 model.

Lease rates for a two-year plan with maintenance will be $128/mo, or $115/mo for a three-year lease. This compares with a Bell rental range of $125- to $170/mo.

ICC is at 7620 N.W. 36th Ave., Miami, Fla. 33147.

Lease Deal Dropped On Eve of Delivery

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IBM for equivalent equipment.

Investors, whether individuals, corporations or banks, actually purchase the equipment offered to the users and take the tax benefits available through the investment tax credit law and accelerated depreciations.

The lessor, in this case Itel, finds the people who will lease the computer the investors have purchased – usually by finding users who have already ordered such equipment from IBM – and then offering to buy the equipment with the investors' money and leasing it to the user.

Because the owners of the system are receiving tax credits and other inducements, they can afford to lease the system at a lower rate than is offered by the mainframe vendors.

Although an SEC spokesman said last week the agency was still processing the plan and would not speculate when approval might be forthcoming, Itel is pushing the plan heavily.

Reduce Operating Bills

A recent letter from Itel salesman John F. Sherman to several users, for example, told users that under the plan they can reduce their monthly operating bills by "as much as 30% to 40%."

Then Sherman said "for the remainder of 1974 Itel will be writing a limited number" of such leases and "there will only be a fixed amount of dollars available for this program."

He warned the users that during 1973 a similar program was sold out in just 22 days; "therefore a quick response on your part is required."

An Itel spokesman indicated last week the firm had offered the plan to some users, subject to receiving SEC approval and raising the needed funds.

The plan has been in registration with the SEC for nine months already, whereas it took the agency only six months to clear the earlier plan in 1973.

Last year the firm raised $6.25 million in equity under the Investors Group Two plan, which was "leveraged" to finance equipment with a market value of almost $25 million.

Under the plan under consideration this year, the firm is hoping to raise $15 million which it expects can be leveraged into financing equipment with a value of around $50 million – if the SEC approval comes through.

Centralization Saves $500,000 Annually for Miss.

JACKSON, Miss. – Centralization of computer facilities here has saved the state $500,000 annually in equipment costs since 1969, according to Charles L. Guest, executive director of the state's Central Data Processing Authority (CDPA).

At the same time, the centralization is offering larger state agencies increased capabilities and permitting smaller agencies their first access to the system, he said.

Guest credits letting "state agencies control their own data processing destinies" with helping to ease the move from departmental computers to a central facility.

Concern over proliferating DP equipment prompted the state legislature to organize CDPA in 1968, Guest said. Department heads of large user departments made up its initial board of directors.

Their assignment was to consolidate their own DP operations to provide the state with a better return on DP spending, but this approach did not work because each member wanted to retain his own equipment, Guest recalled.

There was nothing to force them to behave otherwise and hence, no real progress was made, he added.

A legislative investigating committee reported this lack of progress the next year, and in the 1970 session the legislature established CDPA's board of directors as a legislative group consisting of three house members, appointed by the speaker of the house, and three members of the senate, appointed by the lieutenant governor.

CDPA received title to all state DP equipment, as well as all contracts relating to DP. The agency was also given the responsibility of reviewing existing contracts.

The legislature voted $91,000 to create a written five-year plan, and CDPA went to an outside consultant to give the plan objectivity and credibility, Guest said.

Under the plan each major state agency was to retain its own programming staff and DP manager to determine what jobs in the agency should go on the central computer and when.

The State of Mississippi's central 370/155 serves 26 state agencies through a network of 120 terminals. Checking a point with the computer's console operator is Frank C. Stebbins, director of operations.

CDPA provided the hardware and programming assistance if necessary. The computer center operated as a service to the agencies and charged all costs back to them.

Letting the agencies control their own DP destinies has been a big factor in their cooperation with CDPA, Guest pointed out.

Yet the fact that CDPA must report to the legislature on the course of automation projects encourages the agencies to move toward effective use of equipment, Guest mentioned.

Extra Benefits

Because they are now working with CDPA's 2M-byte IBM 370/155, the highway department has the computing capability under TSO to allow engineers to interact directly with a computer. The motor vehicles comptroller's office can now handle a growth rate of 20,000 to 30,000 vehicle/mo, without a proportionate rise in its own DP expenditures, Guest pointed out.

And he noted that agencies unable to afford a computer previously can now tie into the system. State departments are currently using two IBM 360/20s for remote job entry work, as well as six IBM 2922 terminals and three IBM 3780 terminals, with transmission at 7,200 bit/sec over leased lines.

Departments also use 24 IBM 2260 CRTs, about 40 IBM 3277 CRTs, 19 IBM 2740 terminals, seven 2741 terminals, three Model 37 KSR Teletypes and three Texas Instruments Model 735 KSR terminals.

The CRTs transmit to the mainframe's IBM 3705 communications controller at 4,800 bit/sec.

The data center also provides state users with more storage capacity – in the form of 28 spindles of IBM 3330 disk drives and 12 IBM 3420 tape drives – plus central programming assistance it they need it, Guest added.

Now, he said, other than institutions of higher education, the only free-standing computers in the state government are at the Employment Security Commission, which is 100% federally funded, and a small purchased system at the Alcoholic Beverage Control Board.

There are a few other small purchased systems, all of which CDPA expects to eventually link to its 370/155 as terminals, Guest concluded.

Breaking the DP Umbilical Cord

JACKSON, Miss. – The most difficult part of consolidating a state's DP operations is negotiating with the user departments and making them confident a centralized approach will work, observed Clyde P. Ballard, assistant director of Mississippi's Central Data Processing Authority (CDPA).

Separating the user from his own computer can be a problem, Ballard admitted, but he said the CDPA group eased the transition by getting users involved in the creation of the new center.

A user steering committee allows the users to meet and vote resolutions regarding the center, he said.

Users also attended vendor presentations and took an active role in selecting the hardware for the central site, he added.

If users had an initial feeling "that maybe they were going to be dictated to," these measures helped to change that attitude around, he stated.

The CDPA replaced an RCA 70/45 shared between the Highway Patrol, the motor vehicles department and the tax commission; two 360/40s, one in the highway department and the other shared between the University of Mississippi Medical Center and the state research and development center; two 360/30s in the welfare department and auditor's office; and a Honeywell 115 in the department of education.

Only the two 360/40s were operating under OS, the operating system of CDPA's 370/155.

Homogeneity Seen as Key Ingredient of DP Curricula

Toni Wiseman
Of the CW Staff

MINNEAPOLIS – Industry is not concerned so much with the quality level of computer science graduates, but with the homogeneity of the DP curricula offered by the educational institutions, panelists agreed here recently.

The objectives of the program at George Washington University "are much the same as most other courses," Jack McCarthy, associate professor, said, "with the one difference being that our emphasis is on an appreciation of information technology as a tool of management. This is because we don't expect our graduates to be anything but managers."

The typical graduate student in this curriculum, he said, is in his mid-30s, married with two children and already has a good job in his chosen career field. "He needs the degree to advance in that field, not to change fields," McCarthy said.

Lakewood Community College offers a two-year business application program, David Godderz told the attendess.

Aiming their graduates at middle to large shops in industry, the college has deemphasized Assembly language and RPG courses because none of their graduates to date had been employed in a shop using these skills. "Cobol is the basic language of the curriculum since this is where most will be employed," he said.

Vocational schools were highly praised by attendees during the question and answer period. Robert Pesola, Alexandria Technical Institution, said in 19 months, students at the school were taught five languages (Cobol, RPG, Fortran, BAL and PL/I) and got some 720 hours of hands-on experience.

"For the past few years we've had 100% placement," he said, "and follow-up studies show that less than 5% have changed jobs."

However, countered Van Thompson of Burroughs, "it is simply not possible within a classroom, no matter how much hands-on time students get, to create an environment which is going to be realistic enough to give a person that one element he is typically lacking when he goes into an entry-level job – experience."

It was generally felt by the members of the panel, who represented vocational schools and proprietary schools as well as colleges and universities, that there should be a greater proliferation of minis in classrooms since the number of minis far surpasses that of medium and large machines.

It was also felt that these minis should be made available to students at a younger age, fourth or fifth grade, some suggested. "We have to do more than teach about minis," Godderz said, "we have to teach on minis."

Planners Find Best Use for Each Piece of Land

EUGENE, Ore. – City and county planners here faced with deciding the best locations for schools, fire stations, subdivisions and shopping centers have augmented their own educated guesses with recommendations now generated on an IBM 370/155 computer.

"We want to see if a new idea will work before we commit ourselves to it," explained Lane County commissioner Ken Omlid. "The computers give us that kind of flexibility."

The process is relatively simple. A summary of each parcel of land is stored on IBM 3330 disks – data on who owns it, its assessed valuation, its current land use code, dimensions, topography, vegetation and soil type.

"Then we play a 'what if' game with the computers," explained Randy Stickrod of the Lane County regional information systems department. "For instance, let's say a developer wants to build a subdivision on a specific piece of acreage. We summon up a map of the area on one of our Tektronix T-4014 terminals superimposed with the necessary geocoded data. From this we can find out if it's feasible to get water, electricity and sewers to the site. In hilly terrain we can predict if clearing the land is likely to lead to erosion."

The same process soon will be used to route new roads in the county.

"We will be able to sketch in a proposed route and determine how much the right-of-way would cost, how many people would be displaced and what the environmental impact would be," Stickrod said.

"Then we can check alternate routes until we find one that's best in all respects."

The approach offers other possibilities. For instance, the system can simulate locations of fire stations not yet built to see if they will provide the swift response required in an emergency, Stickrod said.

'Three-Minute Response'

"We must guarantee three-minute response," explained Darwin Lajoie, a systems analyst for the city of Eugene. "Such factors as one-way streets and speed limits must be considered in determining whether a fire truck can reach any location in its primary coverage area in 180 seconds. That's not much time."

The computers already are recording response times on fires handled by the Eugene fire department to help planners determine which other stations should provide second-, third- and fourth-level coverage.

"Because of this computer-based program, we've been able to demonstrate to the insurance industry that our fire response is swift," Lajoie said. "As a result, fire insurance rates here are sharply lower than they otherwise would be.

"We're convinced that computers offer more long-range solutions than any other approach and they can help us make sure that the public is getting its money's worth," said Paul Weber, Lane County's DP director.

The 370/155 with two System/7s acting as front-end processors now serves 30 different user agencies with 160 other terminals round the clock.

The planning function will become fully operational September 1.

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Scientists to Use 'Dataquire' System For Atlantic Survey

Scientists surveying a 200,000 sq-mile section of the south Atlantic Ocean, will use a computerized data acquisition system to record the data and calibrate the results.

The project, the Garp Atlantic Tropical Experiment (Gate), is part of the Global Atmospheric Research Program (Garp), and is designed to measure the consequences of man-made atmospheric pollution and evaluate the feasibility of large-scale weather modification.

Gate researchers will scrutinize weather and sea conditions over a 20 million sq-mile area, running from the eastern Pacific Ocean to the western edge of the Indian Ocean, but will concentrate their efforts on a 200,000 sq-mile hexagon of south Atlantic water, 600 miles off Africa's west coast.

During a 14-week period, scientists on land and sea will measure winds, air pressure, temperatures, humidity, rainfall, solar radiation and sea-surface temperatures.

Ships will drop instruments to a 4,950 ft ocean depth to measure salinity and currents. U.S. and Russian satellites will record information on clouds, winds, day and nighttime temperatures and moisture levels.

All this activity will culminate in aircraft flying daily across a 200,000 sq-mile hexagon off Africa's west coast, relaying information gathered to control or reference sensors and to a Dataquire IV data acquisition system and tape recorder on the ground.

The Dataquire IV will collect the control information from the sensors and instrumentation and store it on tape. The tapes will be used for data bank reference information to calibrate the readings from the aircraft measurements throughout the area.

On board the aircraft will be similar data acquisition systems collecting data also on tape.

Daily, the magnetic tapes will be taken to the computer center and processed for correlation and anomaly studies. The accuracy of the entire program is contingent upon reliable and accurate measurements from the sensors and the Dataquire IV system at the control center.

The Garp worldwide project is a joint effort of the UN World Meteorological Organization and the International Council of Scientific Unions, and is designed to make more accurate weather forecasts possible.

The Gate study of the tropics should solve some meteorological puzzles and aid researchers in building better theories or models of the complex atmospheric interactions around the world.

The Gate project has been in planning for about a decade; the total cost will be in excess of $55 million and involves 13 nations.

The research effort is being coordinated from Dakar, Senegal.

Once the data is gathered it will be processed at centers at Washington, D.C., Leningrad, Hamburg, London and Brest, France. Eventually international Gate computer archives will be established in the U.S. and the Soviet Union.

Those Bottles Keep Rolling . . .

DECATUR, Ala. – Open a bottle of Coke and toast the computer that got it to you so quickly.

Decatur Coca Cola Bottling Co. is using a computer to automate its entire sales and distribution system, including advance ordering; daily customer billing; monthly and yearly comparative invoicing; truck loading and routing; and payroll and accounts receivable.

The General Automation 18/30 disk monitor system lets the firm know at any time how many bottles, cans, six packs or other products have been sold to a customer.

Same Name, Wrong Crime Lands Man in Jail

DETROIT – A series of unlikely events combined to keep a man in jail here for 11 days, falsely charged with a crime committed by another person with the same name.

Alfred Rozier was arrested for a routine traffic violation and, as is the custom at the 2nd Precinct police station, his name was checked through the computer at the National Crime Information Center (NCIC).

Unfortunately, the operator only asked for an identification number on Alfred Rozier, not on Alfred Rozier, black, 27, of a certain height and weight. Consequently, the system provided the police with the number for another Alfred Rozier who is white and wanted for jumping bail.

At least that is what a detective at the precinct guessed had happened, even though no one is sure.

The real problem stems from the fact that when the white Alfred Rozier, who was arrested last November on a breaking and entering charge, skipped bond, the court attached to the bench warrant an identification number given to the black Rozier when he was arrested for carrying a concealed weapon four years ago.

"They gave the white Rozier the black Rozier's number," said John Nicholls, a social services representative stationed at the Wayne County jail. "As a result, when the black Rozier was arrested, the bench warrant listed his old number," and the white Rozier's offense.

It was a clerical error at the local precinct where he was first arrested, Nicholls said, "just not giving the computer a sufficient amount of information to check on."

During his stay in jail, Rozier wrote several letters proclaiming his innocence and asked police, court officials and jail workers to check fingerprints and pictures of the Rozier arrested for breaking and entering. But while Rozier kept saying he was innocent, nothing happened.

A spokesman at the 2nd Precinct said police probably didn't believe Rozier's protestations of innocence "because they all say they're innocent and besides, the identification numbers matched up."

Meanwhile, the confusion which started with a traffic violation and led to 11 days in jail has cost Rozier, father of two, his job as assistant supermarket manager and left him seriously in arrears with his bills. In addition, his Thunderbird, which was left at the spot where he was arrested, has been stripped and the windows smashed.

Rozier is now considering filing suit against the city of Detroit for his car, for losing his wages and for losing his job, Nicholls said.

With Aid of Small System

Tower Travel Agency Tracks Treks of Tour Goers

NEW YORK – Faced with ever-mounting stacks of paperwork generated by American wanderlust, travel agencies are finding that computers may be the only way to keep pace with increasing annual sales.

Zev Melamid, president of Tower Travel Corp., a wholesale tour operator here which has tripled its business volume over the past three years, observed, "Since travel is a service business, efficient processing of the necessary documents is nearly as important as selling. Paperwork simply must be handled correctly or the business may soon find itself in chaos. More than one agency has been torn asunder as a result of the paperwork volumes."

Outside Services Too Slow

Tower Travel handled its paperwork crisis by installing a small computer after the firm found outside service companies couldn't keep up with its growing sales.

"Sometimes our monthly report was up to eight weeks out of date before we received it. We were continually presented with an erratic financial picture," Melamid claimed. "The delay also prevented us from catching many errors before they were compounded. As a result, some bills were either charged twice, or a client was wrongly credited. In the area of conjunction ticketing alone, we found we had paid over $8,000 twice to one airline without knowing it.

"Things finally got to be in such a mess," he recalled, "that the service suggested that we start completely from scratch."

Changes Made

Two changes were made. One was small; the firm assigned an accounting number instead of a group departure number to each client. The other was "rather daring" – invoicing was eliminated and the decision was made to rely wholly on controlling disbursements and receivables internally.

At the same time, the agency's comptroller, Mordechai Gil, undertook to streamline Tower Travel's office procedures. He removed as much paperwork as possible from the sales and marketing department, leaving only the bookings, ticket writing and vouchers to prepare by hand.

Then Gil established a processing department and, in 1971, an IBM System/3 Model 6 computer was installed.

Gil said the system's keyboard techniques for entering data were easily learned by four clerical employees, who enter all debit and credit data into the computer for storage on disks. Should any other bills or invoices come in later for the same client, the entire file is quickly recalled from the disk to ascertain his full financial relationship with the agency.

The general ledger is also posted on the System/3, as are all profit and loss statements and bank reconciliations.

Airline reports, once a headache for the firm, are now produced by the computer and the filing situation has also improved, Melamid claimed.

The computer also supported the agency's entry into the convention field two years ago. Conventions require a capability to efficiently move hundreds of people from all over the country, with allowances for individual adjustments in itineraries.

Because of enormous increases in documentation volumes, Tower Travel has already exchanged the Model 6 for the larger System/3 Model 10 with no increase in the number of employees in the processing department.

Tower Travel expects to enter a new phase in the near future when all of its regular paperwork will be computerized. The system will be programmed by Melamid and Gil, although they are unexperienced in data processing, because they feel that "only agency people can really know the agency's unique requirements."

Once the agency's programs are running on the system, Melamid contended, it will be easier for the firm to face the increasing competition for business from the airlines. Noting that airlines have invested heavily in time and money to provide computer support to their tour departments and are beginning to use overseas travel agencies to handle their tours, he said, "If private tour operators don't incorporate the same computer-based methods in order to process tour arrangements as efficiently as the airlines, many agencies may be hard-pressed to stay in business over the term.

"On the other hand, if agencies adopt computer operations as part of their basic business techniques, the outcome could be very different. Our whole existence may hang in the balance, and the computer could tip the scales."

Scientists Warm to Atmospheric Cooling Model

PALO ALTO, Calif. – Scientists here are using computer-generated mathematical models of the atmosphere in an effort to find out why the earth has cooled down over the past 30 years.

The mean annual temperature near the surface of the earth has decreased by about one-half of one degree Fahrenheit since the 1940s, according to observations by the world network of weather stations.

With the aid of an IBM 360/91, Dr. Norman Braslau of IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y., and Dr. J.V. Dave of the company's Scientific Center here are studying how much radiation from the sun in the form of heat penetrates the earth's atmosphere and how much returns to space.

Braslau and Dave use the computer to manipulate a model "atmosphere" mathematically to see how the alteration of one element such as dust might affect heat transfer in the actual atmosphere.

Carried out in several stages, their first computer simulations took into account the reflection of some radiation by the ground and the partial absorption of radiation by gases, such as ozone and carbon dioxide, and by water vapor and dust.

Hypothetical Dust Layer

The cooling trend of the past three decades has been attributed by some scientists to a hypothetical layer of dust that bounces an increasing amount of solar radiation back into space, Braslau said.

But the results from their models of the atmosphere indicate the effect of dust on the earth's atmosphere's ability to reflect heat has been overestimated, he commented.

"We varied the amount of dust in the computer model to see how it affected the radiation transfer process," Dave said.

"We found that increasing the dust could lead either to heating or cooling, depending on the type of dust, its location in the atmosphere and the position of the sun."

Braslau and Dave said any meaningful or reliable prediction of the course of the earth's climate over the next 100 years would require numerical simulation of a much more sophisticated model. Clouds are being introduced into the model now, making the simulation much more realistic, but proportionately more complicated, they added.

The atmosphere simulation project is an outgrowth of IBM's research into numerical prediction techniques involving global weather circulation and the effect of air pollution on climate, according to Braslau.

Hemingway's 'Old Man' Aged

HANOVER, N.H. – English majors arise! The computer is setting itself up as an authority on Ernest Hemingway.

Darrell Mansell, a professor of English at Dartmouth College, and several graduate students programmed a computer to test his theory that *The Old Man and the Sea* was written in the mid-1930s and not closer to its publication date of 1951.

A 4,500-word sample of the text was prepared, taken equally from the novel's beginning, middle and end. Each word of the sample was coded with a syntax code and the number of syllables.

Similar samples were prepared from four other Hemingway works: *To Have and to Have Not*, written between 1933 and 1937; *The Capital of the World*, written by 1936; *Islands in the Stream*, worked at between 1940 and 1951; and *Across the River and into the Trees*, 1949-50.

After statistical analysis, the computer determined that *The Old Man and the Sea* was most like 1936's *The Capital of the World*.

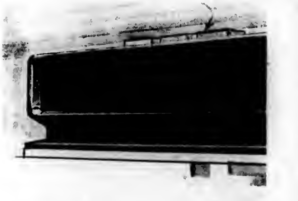
"... Although we did succeed in getting a decisive 'answer,' " Mansell says in a forthcoming article, "I myself would still have little faith in it if it did not support an idea I believe in anyway."

Is It Fish or Foe?

SUITLAND, Md. – Is that strange noise a fish or the Queen Elizabeth II?

The Acoustic Intelligence Data System (Aids) enables the Navy to tell them apart by transforming underwater sounds recorded on magnetic tape into digital information that can be stored in computers, analyzed and retrieved for display on CRTs for further study.

The system, developed by Computer Sciences Corp., can recognize the distinctive underwater noises made by whales, schools of fish and ships' engines.




Recurring Computer Nightmare #11
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Editorials

Thin Blood

As a major annual project of a 22,000 member professional organization dedicated "to education and scientific inquiry in the field of data processing," the recent Data Processing Management Association (DPMA) "family reunion" in Minneapolis [CW, July 3] fell far short of what a professional organization should offer its members.

In many ways, the weaknesses in the program reflect the weaknesses in DPMA.

The Info/Expo more closely resembled a county fair than a serious professional conference, with every free moment and meal period filled with entertainment by local talent and ritualistic homage to past presidents and the like.

The atmosphere seemed to reflect the interests of the older members – many harking back to tab room days. These members, arriving with their spouses in tow at a cost of $55 extra, seemed to regard the event as a time to gather with cronies to reflect upon days gone by.

Only 1,760 attendees (of whom 192 were spouses) registered this year. This slight drop in attendance (from 1,833 with 135 of them spouses last year) is significant since DPMA put a big push on attendance for this show.

The drop could be a reflection of the lack of new material on the program and a possible reluctance on the part of managers to finance a trip where employees would learn very little new information.

In trying too hard to provide something for everyone in the seminars – from the most elementary small-shop management discussions to one on virtual memory – DPMA cannot be credited with doing an outstanding job on anything.

A registration fee of $150 for the full program for members, and an even higher fee for nonmembers, is a dear price to pay for seminars of that caliber.

The needs of an overwhelming number of members seemed to be reflected by standing-room-only attendance at pep talks dealing with person-to-person communication, practical politics and selling one's ideas to management.

Confusion as to the goals and rightful functions of DPMA was never more obvious than in the straw vote taken on the subject of hiring a lobbyist to further the association's interests in Washington. The plan was tabled because members didn't seem to know what those interests might be.

Where is the new blood we heard was running through DPMA? Minneapolis surely would have been the place to show it off.

Cure Worse Than Disease?

The use of computer systems clearly can affect our social structures and institutions for both good and ill.

Unfortunately, advocates of computerization in different institutional areas usually cannot see the possible adverse side effects of computerization when designing or implementing systems.

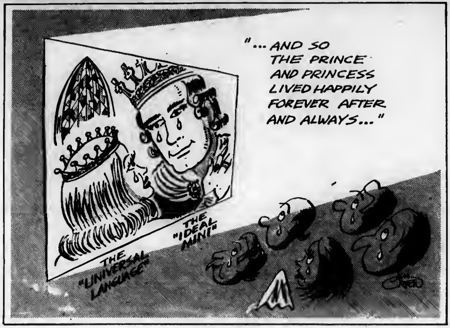
For example, most would agree that the indexing and systematizing of legal information could alleviate lawyers' workloads and therefore give them more time to spend with clients.

But a recent Canadian study indicated the contribution of such systems to the legal profession is slight and their overall effect may actually be unfavorable [CW, June 12].

In addition, the study found, significantly, that the use of such systems may accentuate social inequalities by putting such systems into the hands of the already powerful who can afford them, while denying them to the powerless segments of society.

This one example is probably repeated in many other areas such as medicine, agriculture and publishing.

Clearly we must not be blind when implementing new systems in areas that may affect social balance. More thought and study of possible bad side effects is needed.



Mellow Drama

Letters to the Editor

And Lo, 858 Federal Data Banks Begat 1,716 Data Banks, Begat...

We are all deeply concerned about the protection of each individual's right to privacy, which the two data bank bills proposed in the Senate (S-2810, S-3418) seek to provide. However, some aspects of the proposed statutes present practical difficulties that are not immediately obvious.

For example, the bills require that each organization with an information system containing data on individuals must maintain a list of all persons who have regular access to that information, and a complete and accurate record of every access to the system.

But these records of accesses would then qualify under the statutes as information systems containing information on individuals.

Thus, the immediate consequence of the bills would be that the already existing 858 federal data banks would each spawn an additional data bank of accesses resulting in a total of 1,716 federal data banks. Then each of these records of accesses must have its own list of those who have access to the access list, which immediately adds 858 more data banks.

Since there seems to be no end to this requirement of maintaining lists of those who have access to lists of those who have access and so on, the bills as written will inflate the number of federal data banks without limit.

I am sure the proposers of these bills did not intend to enlarge the scope and number of federal data banks, although this particular provision leads this way.

It would appear desirable for the Congress before passing privacy legislation to appoint a legislative commission charged with the responsibility of producing a bill which would meet the beneficial aim of securing individual privacy and avoid the thorny problems of practical application such as the one outlined above.

E.A. Weiss

St. Davids, Pa.

Single Spacing Saves Paper

A much simpler method of reducing paper requirements than the one suggested by Leo F. Miernicke [CW, June 26] would be to print with single-line spacing instead of double-line spacing, or, if double-line spacing must be used, to print 8 line/in. instead of 6 line/in.

One particular example of paper waste can be seen in the various memory dump routines in Univac's OS/4 operating system, all of which print with double-line spacing. Typically, a memory dump is used only once and then discarded, with perhaps less than 1% of the total data printed out being used. Changing the dump routines to single-line spacing would be a trivial correction, but the result would be a considerable saving in paper.

Another example from the OS/4 operating system is the disk library update routine, where source code correction results in a printout of the total corrected module with double-line spacing.

I'm sure similar examples could be found in routines supplied by almost every other manufacturer as well, so let us start saving paper first by methods which do not require such drastic changes as a printer using both sides of the paper.

Arne Rohde

Bang & Olufsen A/S
Denmark

AEDS Not an Industry Group

An article in the May 15 issue of *Computerworld* by Don Leavitt, in which he commented on one of the meetings at the National Computer Conference titled Business DP Education, contains inaccurate information.

The article mentioned a plea made by one of the speakers for an association "dedicated first and foremost to the needs of data processing teachers." The speaker went on to mention several existing organizations; however, she was mistaken when she referred to the Association for Educational Data Systems (AEDS) as an "industry group."

I do not know how she arrived at this conclusion because the membership of AEDS consists primarily of educators who are concerned with the use of computers in all educational fields of endeavor. This includes instructional as well as administrative uses. The majority of our members, therefore, are involved with "educating the students" and have no affiliation with industry.

The need to support the business data processing teacher is clear, but is still another association really necessary?

James Augustine Jr.
President

AEDS
Washington, D.C.

DP School Doing Its Job – Well

I have read with interest recent articles downgrading data processing schools.

There are, however, some schools doing a creditable job. I would like to specifically refer to the National College of Business in Rapid City, S.D. This school consistently graduates qualified two- and four-year data processing students of high quality.

As an example of the worth of the school's finished product, NCR recently hired approximately 10 graduates.

There is a great need for good EDP schools and the National College of Business is fulfilling that role.

J.A. Morin
Regional Director
Marketing Software Programs

NCR
Denver, Colo.

Computerized Criminal Histories: A 7-Year Blunder?

By E. Drake Lundell Jr.
Of the CW Staff

The seven-year history of computerized criminal history systems is essentially the history of a good idea gone astray.

It serves as a good example of how, in the rush to computerize, early warnings of possible problems can be ignored. The results are evident today as legislators and others try to implement controls after the fact, controls thst were forgotten in the early stages of the criminal history systems.

The idea for computerized criminal histories was a direct outgrowth of tha President's Commission on Law Enforcement and the Administration of Justice's 1967 report entitled "The Challenge of Crime in a Free Society."

That report recommended increased emphasis on applying computer technology for both keeping track of criminal offenders and for tactically deploying criminal justice resources.

However, in the criminal history area, the commission strongly recommended that special precautions were needed to protect the privacy of such records and recommended that all such information be kept solely at the state and local level to prevent any possible interference with the system by the executive branch on a national level.

Project Search

The initial implementation of a computerized criminal history system was undertaken by Project Search (System for Electronic Analysis and Retrieval of Criminal Histories) funded by the Law Enforcement Assistance Administration (LEAA).

This $16 million demonstration project involved 20 states in the planning phases and estsblished standard machine-readable forms for listing criminal histories. A smaller pilot project for exchanging criminal history information had 10 state participants, even though only five states actually exchanged information through the system.

In fact, most of those who did use the system did so only on a demonstration basis, with New York the only state to really use the system in an operational mode.

Under the Search plan there was to be only a national index of criminal history information with the majority of the information to be held on the state level.

Computer terminals in each state would submit information to the central index in abbreviated form. If a police officer queried the national system about a suspect, he would receive just the index information and would have to contact the originating state for details of the person's record.

Project Search was adamant on several points: The system should be primarily run on the local level with only a national index, preferably just on multistate offenders; the system should have definite safeguards to protect the privacy of individual records; and the system should be separate from the National Crime Information Center (NCIC) run by the FBI.

However, in January of 1970 Attorney General John N. Mitchell decided to centralize the system and place it under operational control of the FBI despite repeated objections of both the LEAA and the state officials involved in Project Search.

The addition of the Computerized Criminal History (CCH) system to the NCIC was a major departure. Until that point the NCIC had kept information only on wanted persons and six kinds of stolen merchandise: vehicles, license plates, securities, boats, guns and miscellaneous items. There was no personal information except on persons actually wanted for a criminal offense.

A typical use of the traditional NCIC system would be for a Michigan patrol car following a suspicious car with Florida license plates to radio headquarters asking for a check on the license number to see if the car was stolen. If it was, he would make an arrest.

By necessity, the system was quick and easy to use, and there was little worry over privacy invasions.

However, a problem arises with the decentralized nature of the system in that local police are completely responsible for all data entry. For example, if a car is stolen in Lansing, Mich., and recovered in Bloomington, Ind., the Lansing police must add the listing to the file and the Bloomington police must remove it.

Historical Perspective

Unfortunately, experience has shown that police are much quicker to add information to the system than to delete it, and there have been several cases where car owners have been arrested for stealing their own cars due to a failure to update the records after recovery of the stolen vehicle.

This was not considered to be a major problem until the criminal history files – which contsin a notation of an individual's every contact with the law – were added to NCIC. These files, usually called "rap sheets," contain a record of every arrest, whether or not it leads to a conviction or even results in a trial.

These files are obviously more sensitive than any of the other NCIC categories, yet the FBI originally did not plan to provide any increase in protection to these files.

Today, with concern over the possible misuse of such files increasing, the bureau is moving in some limited areas (not sending criminal history information directly to police cars, not giving out information over a year old to non-law enforcement agencies, etc.) but many critics contend these measures do not go far enough and are essentially patches on a poor system.

Presently, there are no laws requiring states to update the files of criminal history information and the only penalty for not updating is exclusion from the system (as recently happened In New York [CW, July 3]).

In addition, there are no penalties – either civil or criminal – for misuse of the information in the criminal history files and no legal requirements for purging the files as they become outdated.

At the same time, many critics of the system feel it basically undermines the underlying principle of American justice – that a person is innocent until proven guilty.

These critics see no reason to store sny information on arrests alone, unless that arrest is followed by a conviction for a crime. Alternatively, they would require that every entry in such a system at least contain the disposition data (found guilty, innocent, case dismissed or charge dropped) before it could be entered into the system.

Most laws proposed to deal with the issues presently being debated would not go that far, but would rather allow a person the right to see a record and correct it, and would impose civil and criminal penalties for any misuse of the data in the records. In addition, most of the proposed laws would require police agencies to keep a record of users of the system for sudit purposes and would legally require agencies to update the records.

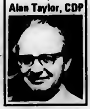
Whatever measures are finally adopted, it is clear that criminal history systems as they have evolved to date are grossly inadequate and that some new controls need to be legislated.

Should Government Investigate Top DP Consultants?

Recently the data processing profession has been hit by growing outside concern about the potential abuses of data banks. Some of the reports have been well publicized – such as the 1973 Health, Education and Welfare Department (HEW) report, "Computers, Privacy and Automated Personal Data Systems," or the setting up of the Ford Committee by President Nixon.

But these have only been the tip of the iceberg. On the same day the HEW Committee report came out, for instance, Sen. Ervin's Committee on Constitutional Rights issued a report showing many instances of constitutional abuses occurring in this area. And in another twin-header, on the same day President Nixon appointed the Ford Committee, the United Nations Secretary-General also independently blasted the data processing operations.

The Taylor Report
By
Alan Taylor, CDP



Within the profession, however, little was said. No one, to my knowledge, has looked to see what the mechanisms were that could permit the creation of improper data bases. Yet, this would appear to be where professional attention should be focused, so as to ensure professional correctitude in the future.

One of the mechanisms which can permit the creation of inadequately secured data is shown in a public Mitre Corp. report – "The Massachusetts Superior Court Case Management System (CCMS)" (MTR-2758). The report is in four parts, covering system specification in part 1, with the equipment, software and facility specifications in parts 2, 3 and 4 respectively.

Under the heading documentation, the first system specification is defined as being "the top-level specification for the CCMS and sets forth the overall criteria establishing the system's performance, design, development and test requirements."

The Senior Document

This seems to settle matters with part 1 being the senior document. The system is a logical system, because then any differences between parts 2, 3 and 4 and part 1 can all be determined; while differences among the lower documents can be handled within the general restrictions of part 1.

This is comforting to the outsiders who have to look at the system (such as the judges of the Superior Court, the district attorneys in the state, and the court clerks, for instance). They can assure themselves that the data is adequately protected, simply by checking the senior volume.

In the case of CCMS there is certainly a need for such assurances of safety being available to the judges. The data includes information gathered about all attorneys appearing before the courts – and their firms; as well as details of all possible witnesses who will be called or who have been called.

Changing a digit in the data base can indefinitely postpone an upcoming trial, and, as long as such modification took place on the same day that a proper change was made in the record, no normal audit will detect the change.

Assurances Given

In this particular case, non-computer people are reassured in the top-level volumes by various items, such as, that one of the two primary effectiveness factors for the operation of the system is "the integrity of the data base itself in being secure from misfiling, unverified data, destruction from internal or external causes, activities of unauthorized users or operators or other misuse of the court's records and reports."

They will also be pleased to note that the terminals in the various court clerks' offices "shall not have the capability to produce responses to requests concerning witnesses involved in any criminal case pending before that court, or for other criminal matters involving a defendant in other countries."

Assurances Overridden

It is understandable that such lay reviewers of the situation could expect to act, secure with these assurances. Unfortunately this would not necessarily be a correct thing to do, because the details of the system given in the junior documents are allowed to override the top-level assurances!

Junior documents contain details which show that the terminals are general-purpose ones, restricted only by easily modifiable programs, and *can* produce responses to improper requests! The security system on data entry is simply the *same* operator "sight verifying" which *does* risk the integrity of the data base!

Moreover, the difference between the assurances and the technical facts are not apparent mistakes, but a deliberate result fully authorized by the Mitre use of a "precedence" paragraph, which reads: "This specification provides the overall system framework within which Specifications CCMS-2, CCMS-3 and CCMS-4 were generated. In the detailed development of the system's functional areas, however, those specifications take precedence over this specification."

In short, the top-level specification comes at the bottom of the list of precedence! And yet Mitre uses it to give strong assurances of protection that just are not in the system!

'Hiding the Facts'

It is not only in security matters that these Mitre reports appear to be effectively hiding the facts. Dollars, as well as data, are handled in a surprising way for such a top-level consultant.

For instance, the cost-effectiveness studies which are claimed to show that it is cost-effective to put remote terminals in courts handling over 1,000 case-trial units a year are neither included in the report itself, nor are they listed in the appropriate section of the report (Section 2, applicable documents).

In fact, the cost-effectiveness of the system as a whole is extremely suspect, as the reports indicate, for instance, that much of the Mitre-defined minimum levels of equipment will be standing idle over 95% of the time!

It appears to me that with the DP profession's continued failure to police itself, Vice-President Ford and Senator Ervin should now investigate the way in which DP abuses are hidden through the use of such inadequate documentation techniques being used in feasibility and other studies.

Does PM Prevent – or Present – System Problems?

By Kenneth R. Strandberg

Special to Computerworld

Preventive maintenance (PM) is as old as the computer industry. Its intent is to avoid costly downtime by doing maintenance on a scheduled basis to prevent or avoid unscheduled breakdowns.

But is PM necessary to the health and well-being of a computer system? Or is it a technical ritual controlling downtime as much as a rain dance controls the rain?

Worse yet, does PM actually cause trouble? Could it be that the user turns over a healthy computing system and gets back one with the disease of "Technician Induced Failure (TIF)?"

That's not as fantastic as it sounds. Some users will recall incidents where the computer could not be returned on schedule because, "the technician found some problem or problems, which require more time to correct."

In the latter case the value of PM is clearly evident. The technician was able to uncover a hidden weakness and is fixing it before it causes more serious problems.

That is one answer, and it is the one both the technician and his company would like you to believe. In fact, due to personal involvement and a nonobjective position of evaluation, it may well be that the technician truly believes this statement himself. But it may not always be so.

If the part being replaced is electronic, such as a printed wiring board, there is a high probability that this trouble could have been prevented by preventing preventive maintenance. In short, the problem may have been TIF. If there is more than one electronic component being replaced, it is almost certain to be a case of TIF or shotgun troubleshooting or both.

Viewpoints

It is clear that with minor exceptions the technician cannot stress the electronics of your computer any more than you can. He runs test and diagnostic (T&D) programs which use the same instruction set. They differ from user jobs only by insuring that all commands are exercised, by providing predefined results for comparative tests and by providing output in a uniform way.

Secondly, component failure always has a cause. In some cases this cause is very evident such as a storm, an air conditioning failure or a cart pushed into the side of the machine.

In other cases there is no discernible cause. The component appears to have failed at random.

In truth, the short life of the component is the result of its history. It may be because of material impurities, marginal or out of tolerance manufacturing or its past or present environment.

Since the technician cannot stress the electronics any more than normal operation, it follows that it is just as probable for random failure to occur during PM as it is for it to occur during a similar time period of operations.

In short, the frequency of failures during PM vs. normal operation should be the same.

Without a mathematical analysis of probability, it is clear that simultaneous failure of two or more components in the relatively short period of PM, without common linkage, should be a very rare occurrence.

This is not a condemnation of the technician, but rather the recognition of the problem. Recognition of this most common problem is the first step toward its solution.

Kenneth Strandberg is an independent DP consultant in Scottsdale, Ariz.

Independent CPUs Should Comprise Future Mainframes

By Lawrence N. Salveson

Special to Computerworld

IBM has given us a very good idea of what to expect from computers in the future. It has already eliminated the typewriter console and light displays in favor of a CRT.

Machine checks are now automatically logged onto a diskette without software intervention. It is true: microcoding and reloadable control storage are coming of age.

But there is more.

All 370s come with a set of control registers. These registers control several microprograms which perform monitoring, dynamic address translation, prefixing and other functions. If one extends the 370 design it is easy to arrive at the following conclusions.

A mainframe (let us call it a CPU) will consist of several independent processors. Each processor will have the capabilities of current CPUs: control registers, general registers, etc. The system will be capable of running in multiprocessing (MP) or stand-alone mode.

By using the prefixing scheme, memory can be divided into pieces each exclusively used by a processor group. A processor group would consist of one or more processors being run in MP mode.

The CPU will contain logic to interface between the processors, allowing all processors access to any channel.

With this scheme it would be possible to run multiple operating systems without any emulation involved; no conversion would be required for on-line or Micr programs.

Once conversion was complete, or when an operating system was not needed, the extra processors could be used elsewhere. On-line systems receive a fail-safe mechanism as failing processors are disabled and processing continues without interruption.

It is also expected that channels will become more "intelligent." More I/O errors will be retried by the channel and virtual addresses will be allowed in Channel Command Words (CCWs) and other I/O-related fields. These features will reduce the amount of nucleus code required for VS support resulting in a faster and more reliable system.

These features may appear to pose problems to existing operating systems, but very few changes are required to support the new MP machines. By adding a three-byte "end of real memory" field, a one-byte processor group number and two control bits to the control registers, nucleus changes would amount to fewer than 50 instructions.

Memory will come to be just another shared device, but with more flexibility than any other peripheral. Indeed, this direction is clear.

Lawrence N. Salveson is a systems and software consultant in Mill Valley, Calif.

Random Notes

Sequential File Capability Added to MRI System 2000

AUSTIN, Texas – A sequential file capability has been created for the System 2000 data management system from MRI Systems Corp. The feature will allow the user to access data bases residing on sequential media through the Procedural Language Interface or the Report Writer Module.

A LINK command can be used in conjunction with the sequential file, and it allows establishment of logical associations among physically separate data bases including those residing both on tapes and disk. With this the user can create his own networking system and automatically retrieve specific patterns of data, according to the firm.

The feature is presently available for Univac systems with IBM and Control Data versions in the works. The feature costs $1,500 from the firm which can be reached through P.O. Box 9968, 78766.

Time-Shared Word Processing Offers Two Special Features

NEW YORK – Browne Time Sharing, Inc. is now offering a time-shared word processing service with two special features.

The Proofmark feature produces an identifiable mark in the right hand margin of each page next to the lines on the page that have been altered from a previous version. This eliminates the need to reproof every line.

The second feature gives every line of the text a number so that corrections can be made more easily.

Another new capability of the "Word One-Plus" service is a command called "Column Format." Utilizing this command, information structured in columns on the page, such as financial data, can either be automatically dropped from certain versions of a document or moved horizontally in one direction or another for emphasis.

Browne is located at 345 Hudson St., 10014.

Hitachi Selects 'Score'

NEW YORK – Hitachi has decided to develop Programming Method's Score System as standard software for Hitachi computers.

Score is a multipurpose Cobol generator that allows the development of file management applications through nonprocedural parameters. The system converts these parameters into custom-tailored Cobol programs which are then compiled and executed to perform the requested functions.

Standard Assembler? – Part 3

Subset Serves to Stabilize Differences

By John J. Archer
Special to Computerworld

The results obtained in the universal symbolic assembler project (Unisym) feasibility study split the target machines into two classes. The accompanying table shows the overheads estimated for the 10 machines examined, in program storage and execution time when the full set of Unisym was used together with unbiased mapping.

A study to determine the costs required to make Assembler-level software transportable over a range of minicomputers was recently completed for England's National Computing Centre by Synergy Software Ltd. John Archer was the company's chief design consultant on the project, called Unisym.

The hardware characteristics of the first four machines and the last machine in the table were extensive enough to allow biased mapping of the Unisym virtual machine – that is, all Unisym registers could be mapped into target machine registers for these machines, and the two types of mappings (biased, unbiased) were equivalent. Thus, it would be expected that the overhead figures for these machines would be fairly low.

However, the remaining five machines had limited hardware capabilities, thus producing much higher overhead figures. As mentioned previously, the Digico Micro-16V overheads of 194% and 233% reduce to 17% and 55% respectively when biased mapping is used together with that subset of Unisym which corresponds to the target machine and Assembler language. Similar reductions could also be expected for the Data General Supernova, GEC-2050, Honeywell 716 and Hewlett-Packard 2100A.

A certain amount of consideration was devoted to input/output (I/O) in the later stages of the study and it was decided to standardize the Unisym I/O concept into one of virtual elements (e.g. virtual disk, etc.) and also to divorce the programmer from the I/O idiosyncrasies of target machines by using a control block. The programmer would then use Unisym Instructions to fill in the control block and transfer control to an I/O routine to effect the data transfer.

The I/O routine itself would take care of the mapping of the virtual Unisym I/O system into the target machine I/O system, and it was estimated that the overhead generated by this type of mapping would be relatively low.

The mapping of Unisym data structures onto the 10 target machines would present very few problems, since all of these machines have a word length of at least 16 bits. However, real problems would arise for mapping onto machines of word length less than 16 bits, since most Unisym instructions would be subject to heavy overhead in their macros – this applies particularly to arithmetic-type instructions.

Machine	Estimated % Overheads of Programs	
	Storage %	Execution Time %
ABS GRI-99	41	40
Arcturus A16-D	8	48
CTL Mod-1	1	43
DEC PDP 11/45	0	33
DG Supernova	202	238
Digico Micro-16V	194	233
GEC 2050	213	207
Honeywell 716	188	280
HP 2100A	178	213
SPC-16	87	138

Estimated overheads caused by use of Unisym with unbiased mapping reviewed.

The Unisym project has reached a checkpoint in its development. The package, as it stands, can now be sold to a number of users (of the current targets) without having to recode it each time for a particular machine.

Software Concepts Transferable

It might be used by others as well. A manufacturer could, for example, transport the software concepts over a different range of machines with 16-bit or larger words. In addition, high-level language compilers could be written in Unisym to make the current level of transportability more effective. The universality of Unisym makes it a good candidate as a cross-assembler, in order to continue development work even when the actual target machine is unavailable.

Finally, it appears that Unisym may lead to standardized hardware definitions (number of registers, etc.) which would be useful to the mini manufacturer and, ultimately, to the user in trying to sort through what has been, until now, a bewildering array of configurations.

'Context' a Key to Accessing Entries in Textual Data Bases

NEW YORK – Researchers are able to access information from textual data bases through references to index entries or descriptions of conditions to be met with the Context retrieval system for text or data now available from Base, Inc.

The system is written in Cobol and is essentially machine independent. It has been implemented in a 120K region under IBM's OS/360, but will probably also be available on a nationwide remote computing network for those users who need the capabilities on a less than full-time basis.

The system creates an index that contains every significant word and symbol used in the text as it is being entered.

By naming a word or symbol in a request, the user is able to determine if it appears in the text, and then – if it does – how often and where. With those specific citations available, the searcher can then have specific lines of text printed for review.

The conditional search pattern allows the definition of two or more words that specify an idea, a situation or a concept, utilizing Boolean connectors, if needed, to delimit the search. Again, under this search scheme, the system reacts with a count of the number of situations it finds that meet the specified requirements, and a list of the specific locations, in terms of whatever text organization the user has established.

The user is able to then control which entries are printed. If the search, on the other hand, finds no matches for the condition described, the user can cancel the request or work through a companion thesaurus, seeking synonyms for the words that went unrecognized the first time.

In a function similar to the thesaurus search, Context provides the index searcher with all variations of the root word, and the locations of those variations. In this way, the user can adjust the search as he sees what is available.

The basic Context system can be leased for in-house use for $1,000/mo or bought for $50,000 plus a monthly maintenance fee. Tailoring of the system to unusual hardware configurations or special user needs will add to the lease or purchase price, a spokesman noted.

Base is at 437 Madison Ave., 10022.

IBM Typesetting Packages Compose Text, Classifieds

WHITE PLAINS, N.Y. – IBM has two new automated typesetting programs for publishers. Printext/370 allows production of hot metal and photocomposed text and Printext/370-Classified, which operates only with Printext/370, produces classified ads.

Both programs run on virtual storage models of 370 CPUs with a minimum main memory of 256K.

Printext/370 is scheduled to be available in April 1975 at $450/mo; the classified option is planned for July 1975 at $255/mo.

ACM Has Undergraduate Guides For Business Information Study

Guidelines for bachelor's level academic programs in business information systems were published in the December 1973 issue of *Communications of the ACM*. It seems reasonable to assume that these guidelines will be as widely accepted as were the Association for Computing Machinery (ACM) developed guidelines for computer science curricula. Therefore, it is important for persons hiring the graduates of these programs to become conversant with the curricula.

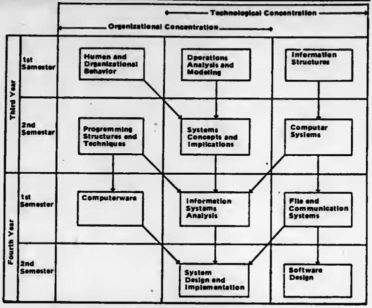
J. Daniel Couger On *Education*

The curriculum proposal specifies an 11-course sequence. Two concentrations are outlined: a technological concentration and an organizational concentration:

- Organizational Concentration – This option is designed to prepare a person to be an effective computer user. The undergraduate student, therefore, combines information systems course work with the academic area of emphasis in a field of application, such as business or government. With the five-course option in information systems, the student essentially has a double major with, for example, marketing or political science or hospital administration.

Upon entering a career field, the graduate will be able to participate effectively on a system development team of users and practitioners.

- Technological Concentration – This option is designed to prepare a person for an entry-level job in an information processing department. The graduate would typically begin as a programmer and, through practical experience and advanced education, qualify to move into the area of logical and physical system design.



Two concentrations in Information Systems Program outlined.

The sequence of core courses is shown in the figure above for both organizational and technological options: the core concentration for the information systems specialty fits into the third and fourth undergraduate years. The typical undergraduate program also includes general education components and general field requirements imposed by the department or school under whose auspices the program is taken.

The curriculum design team, comprised of academicians and practitioners, began its work with the identification of qualifications expected of graduates. It is impossible to do justice to the 23-page report within the brevity constraints of this column. However, a listing of the qualifications for the technological option shows the program's scope:

- People – Ability to interact verbally with others, to listen and understand the views of others, to articulate and explain complex ideas.
- Models – Ability to formulate and solve simple models of the operations research type, and to recognize the kind of situations in which they apply.
- Systems – Ability to view, describe, define any situation as a system – specifying components, boundaries, and so forth;

Ability to present in writing a summary of a project for management action (suitable to serve as a basis for decision);

Ability to present in writing a detailed description of part of a project, for use in completing or maintaining same.

Computers

- Computers – General knowledge of basic hardware/software components of computer systems, and their patterns of configuration;

Ability to program in a higher-level language;

Ability to program a defined problem involving data files and communciations structures;

General knowledge of sources for updating knowledge of technology;

Ability to develop several logical structures for a specified problem;

Ability to develop several different implementations of a specified logical structure;

Ability to develop specifications for a major programming project, in terms of functions, modules, and interfaces.

Also, ability to discuss the major alternatives (assuming current technology) in specifying an information processing system, including data files and communications structures, to the level of major system components;

(Continued on Page 15)

ACM Issues Undergraduate Study Guides For Business Information Curricula

(Continued from Page 14)

Ability to sketch "rough-cut" feasibility evaluations (in terms of economic and behavioral variables) or proposed new techniques or applications of current technology, identifying critical variables and making estimates and extrapolations;

Ability to sketch an economic analysis for selecting among alternatives above, including identification of necessary information for making that analysis, and also to identify noneconomic factors;

Understanding of the process of developing specifications for the computer-based part of a major information system, with details of task management and data base management components.

Organizations

- Organizations – General knowledge of the function of purposeful organizational structure, and of the major alternative for that structure;

Knowledge of how information systems are superimposed on organizational patterns, on the operational, control, and planning levels;

General knowledge of techniques for gathering information;

Ability to gather information systematically within an organization, given specified information needs and/or specified information flows;

Ability to outline, given information needs and sources, several alternative sets of information transfers and processing to meet needs;

Ability to sketch "rough-cut" feasibility evaluations of such alternatives;

Understanding of the process of developing specifications for a major information system, addressing a given organizational need, and determining the breakdown into manual and computer-based parts.

- Society – Ability to articulate and defend a personal position on some important issue of the impact of information technology and systems on society (important, as defined by Congressional interest, public press, semitechnical press, etc.).

Funded by the National Science Foundation (NSF), the curriculum was a full year in development. As in the case of the masters level program, the results were circulated for comment by academicians and practitioners. In addition, a two-day review was conducted, with representatives of government, industry and academia.

The guidelines are useful not only for educational institutions but also for industrial and government training directors responsible for updating personnel who have not graduated from such programs.

Couger is professor of computer science and management at the University of Colorado.

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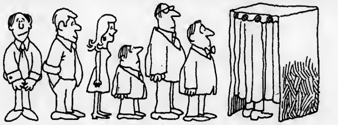

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We selected this seminar for possible inclusion in the EDP Seminar Series after watching it in action. It was developed by Performance Development Corporation under the direction of its President, Leo J. Cohen, a nationally known consultant in data base systems. Mr. Cohen will continue as seminar director, and the seminar leaders are PDC staff who are experts in their own right. They include Alan Stutz and Steve Robinson, both of whom are well-known for their work in this area. All instructional staff have been involved in design and implementation of a variety of data base systems for major U. S. companies.

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Vote 'yes' today.
Whether or not we hold this seminar will depend on your response now. If interest is sufficient, we plan to hold these seminars in several cities this fall. When the decision is made, we'll send you an advance brochure and registration form, giving you first chance to enroll. So, if you're interested send in the coupon now. There's absolutely no obligation.

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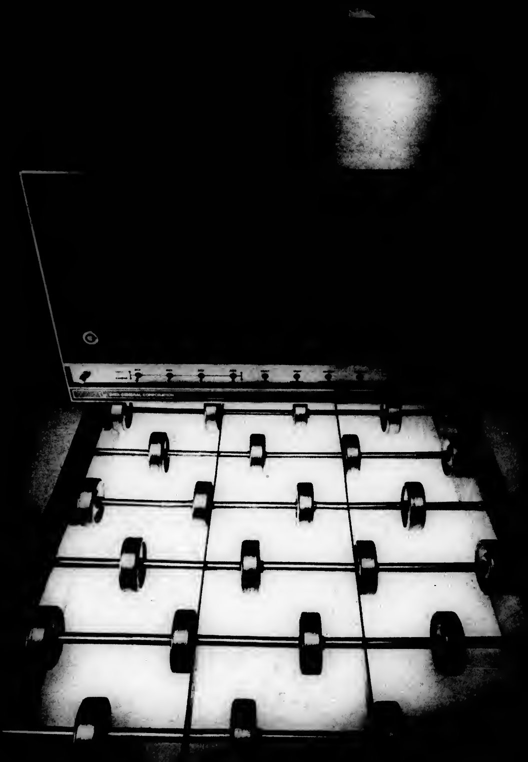


The 840 out of Southboro
is now scheduled to arrive in 45 days.

COMMUNICATIONS

Survey Shows Performance Good, Support Poor

How Do Terminal Users Rate Their Equipment?

By Ronald A. Frank
Of the CW Staff

DELRAN, N.J. – If the results of a recent Datapro survey of remote batch terminal users are typical, then the average user would have the following characteristics:

The user would be operating on private voice-grade lines at a speed of 4,800 bit/sec, probably with a 370/155 or larger IBM mainframe, and there is a good chance he would be using 2780 emulation on his terminal.

These conclusions were based on responses from 175 users who had a total of 875 installed terminals.

Although most of the users surveyed were generally pleased with overall performance, ease of operation and reliability, 23% said their maintenance was fair or poor and 30% gave unfavorable responses to describe their software and technical support.

Low 3735 Scores

One terminal that scored noticeably low in the user ratings was the IBM 3735, which got low scores from users for overall performance, hardware reliability, maintenance and support. Included in the 3735 opinions were 53 installed terminals from five users.

While 43% of those surveyed operate at 4,800 bit/sec, a high percentage of users also transmit at either 2,000 bit/sec (24%) or 2,400 bit/sec (28%). A surprising number of users transmit their data at 9,600 bit/sec (12%), the survey showed.

From the 183 responses, the average volume of data transmitted daily was 8,740 record/day; 56,900 print lines were received daily, and 3,000 card/day were received and punched. However, in the latter category only 27% of the users said they were punching cards.

According to Datapro, the print volume per day represents three hour/day for a 300 line/min printer or about 1.6 hour/day for a 600 line/min unit.

Most of the users had IBM CPUs with 44% using a Model 155 or larger machine and 24% running a smaller 370. Significantly, 22% still ran a 360/50 or larger machine and 9% were using a small 360. About 10% had Control Data mainframes, 8% had Univac and 3% used Honeywell CPUs.

A total of 29 terminal models or families were represented and out of the 875 terminals installed, 417 were supplied by IBM. The largest IBM group was 122 360/22s and 112 3780s. The next largest vendor represented was Data 100 with 134 installed terminals.

Most of the equipment (62%) was operating on private voice-grade lines with 8% running on wide band and private microwave systems. The rest of the terminals were using dial-up facilities.

The report on remote batch terminals is available at a cost of $10 from 1805 Underwood Blvd., 08075.

'Minicomm' TP Monitor Suits Small On-Line User

By Patriek Ward
Of the CW Staff

WILMINGTON, Mass. – GT&E's Minicomm TP monitor offers an "architectural simplicity" that makes it well suited to the needs of the small on-line systems user, according to one such user here.

Ed Malakoff, technical support manager for Sweetheart Plastics, described Minicomm as a CRT monitor that handles display terminals for IBM 360 and 370 DOS installations. There are versions to run local displays in a batch-oriented environment without multiprogramming, in a local display multiprogramming environment, and with local or remote displays in a multiprogramming environment.

Malakoff has four local IBM 3270 CRTs and has used Minicomm's standard type two version on his 96K 370/135 since first going on-line last November.

Sweetheart Plastics, a maker of single-service dinnerware and food packaging, uses its on-line capability mostly for inventory control, with the CRT operators handling all aspects of creating, shipping, and changing bills of lading.

No Multitasking

While the Minicomm package works for him, Malakoff thinks its lack of a multitasking capability makes it the wrong choice for a user with over 40 actively used terminals. However, he said GT&E is bringing out a new version with multitasking capability, and that version should be better adapted to handling more terminals.

But if a user is big enough to have 40 terminals, Malakoff observed, he may want features not available on Minicomm and so its price advantage may be less impressive.

Malakoff chose Minicomm after evaluating Taskmaster from Turnkey Systems, Inc., Westi-Local, and Minimum Telecomm System (MTCS), an IBM field-developed package.

Too Much Core

Taskmaster cost more and took too much core to operate in his machine's 24K F1 partition, Malakoff said. However, he noted that the package provides such features as transaction logging for tracing problems.

Minicomm only provides a data capture file, which Malakoff uses for transaction logging of some parts of his workload.

Westi-Local, from Westinghouse Tele-Computer Systems Corp., cost only $3,000, or $5,000 less than Minicomm. Malakoff felt this package came close to matching Minicomm's best points, but he said its manual was far less easy for the applications programmer to follow than Minicomm's, although it was more complete. The package occupies 10K, he recalled.

Malakoff said he felt MTCS was less efficient than Minicomm and would take more core, although he wasn't sure how much. If MTCS had been a regular IBM product rather than a field-developed program, Malakoff said he would have been more enthusiastic about the package, which costs $395/mo for 12 months.

Good Mapping

Minicomm's main advantage is architectural simplicity, Malakoff stated. The package's resident coding and two I/O areas take 7K in the F1 partition, leaving 17K for applications programming, he said. And Minicomm does a good job of input and output mapping, even with 7K, he remarked.

The system's 54K background partition contains an 18K DOS supervisor running under release 27, he added.

It is relatively easy for programmers used to batch work to learn how to program with Minicomm, Malakoff said, since the package closely simulates batch programming.

Must Know 3270

That is assuming the programmer knows the basic architecture of 3270s, he noted. No one in his own shop had programmed for 3270s before, and this made the first applications programs hard work, he remarked.

Now programmers can add a new record to the on-line inventory file during the day from the 3270s, Malakoff mentioned. The records can be retrieved and updated immediately.

All of this takes place within the F1 partition, he noted.

The installation includes three spindles of IBM 2319 disk drives, two 3420 tape drives, a 1401 printer, a 2540 card reader/punch and a 3284 terminal printer.

In daily use, the 3270 operators enter the customer number; then the system retrieves the name and address from the file. When the item number is entered the system automatically retrieves such information as the product description and weight per case.

If there is an error, such as entering a nonexistent item or customer number, the system interacts with the keystation operator.

The on-line program both formats the data for printing on the bill of lading and subtracts the products from the available amount on the inventory file.

This home-grown package is called Olive (On-line Inventory Verification and Entry). The next on-line project will be Pimento (Processing Invoices by Minicomm for Energetic Tube Operators) to handle billing.

Artichoke, for accounts receivable, will be next, Malakoff reported.

Malakoff said his firm purchased Minicomm for $8,000.

Device Secures 5-Level Circuits

DALLAS – Datotek, Inc. has a device for securing all types of five-level teleprinter message circuits.

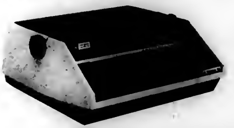
The DC-125 is designed to encipher data as it is being transmitted on-line or to prepare enciphered message tapes off-line prior to transmission. The unit is capable of operation in three modes:

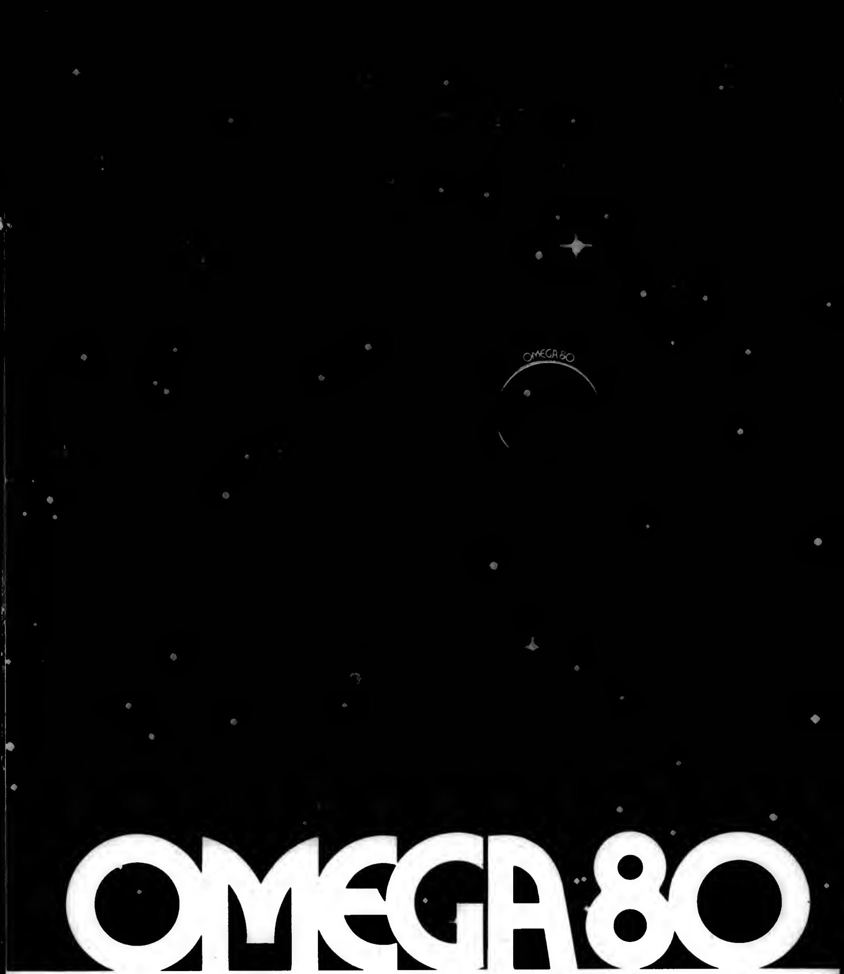
- On-line asynchronous – compatible with Telex and other switched common carrier circuits.
- On-line synchronous – compatible with radio/Teletype circuits or with marginal-level teleprinter circuits.
- Off-line – compatible with Telex, Teletype and other systems.

Features include:

- Speeds of 45-, 50-, 57-, 75- or 100 bit/sec.
- Packaged for easy installation in 19-in. racks.
- Total of 32 trillion security codes.
- Interface with "virtually all teleprinters in common use" by control switches on front panel of power module.

The device costs $5,400 on a 90-day delivery from 8220 Westchester Drive, 75225.

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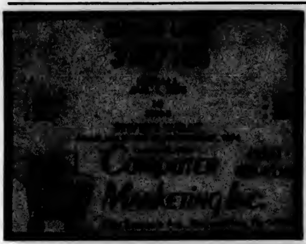


Wiltek CRT Data Entry Uses Mag Cards

NORWALK, Conn. – Wiltek has come out with a CRT data entry and retrieval system using a magnetic card reader/recorder which permits stand-alone order entry, updating of customer files and on-site storage of data at local offices.

The System/500 batches data and, when polled by a central computer, automatically transmits it over standard dial-up lines at up to 2,400 bit/sec.

System Components

System/500 components include Wiltek's MCR II magnetic card reader/recorder, the Model 500 data communications terminal and a choice of 10-, 30- or 120 char./sec Wiltek printers.

The operator can create formats or enter variable information on the CRT terminal, then transfer this data to magnetic cards via the MCR II. Each 3 in. by 7 in. magnetic card stores up to 6,400 characters. The data can then be recalled, edited or updated on the CRT screen before permanent and variable information is merged and transmitted.

Data moves from screen to card at 240 char./sec and from card to screen at 480 char./sec. A full screen can be recorded on a card in less than eight seconds, displayed from a card in under four seconds or transferred to buffer storage in less than 13 seconds.

The Model 500 CRT displays 1,998 characters (27 lines by 74 lines) on a 12-in. screen and has a dual-intensity display to distinguish formats and fixed data from variable information.

Block Control

Data is transmitted in bisynchronous mode on a block-by-block basis. If the system's communications control unit spots an error, the block is automatically retransmitted.

The system's standard modem is a 1,200 bit/sec unit equivalent to Bell's 202C and has auto/answer capabilities, a Wiltek spokesman said.

A 2,400 bit/sec modem is optional.

The spokesman said a "typical" System/500 would lease for $318/mo, including maintenance. Delivery is 90 to 120 days from the firm at Glover Ave., 06850.

Unattended Unit Tests Sycor CRTs

ANN ARBOR, Mich. – An automatic test facility may trim the cost of Sycor users' diagnostic calls to the company's communications test center here, according to a Sycor spokesman.

It typically takes five minutes for a Sycor serviceman to routinely check out a newly installed terminal through an unattended "Robot" Sycor 340 here, as opposed to 10 to 12 minutes by a call to a staff member, the spokesman said. The user pays for these phone costs, he noted.

Relieves Staffers

The company installed a Sycor 340 terminal here last October, with the primary objective of relieving the number of calls being handled by the test center's staffers.

The unattended terminal is available for calls 24 hours a day.

In operation, a Sycor serviceman at the user site inserts the software to transfer the user terminal into a master station.

He then dials up the unattended 340 here, and is able to exchange data with it to check out the user terminal.

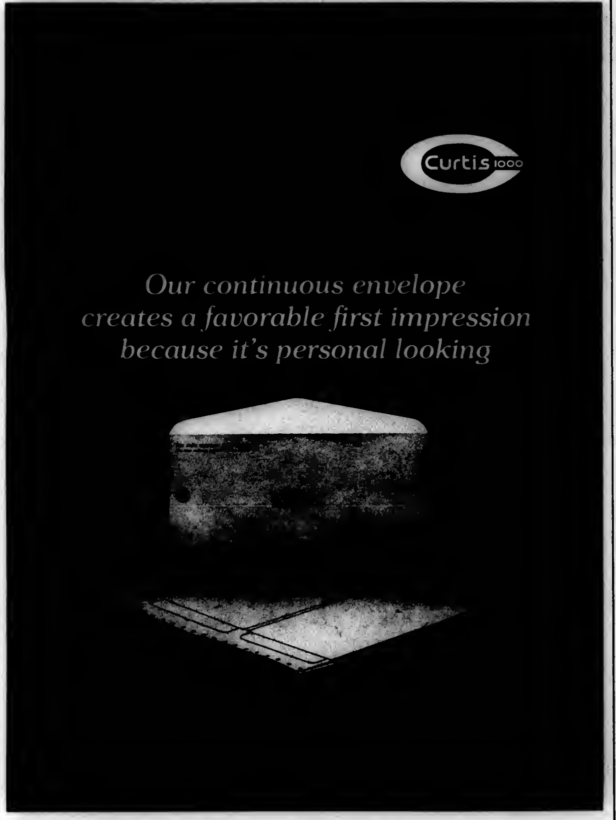
If there is a problem, the serviceman could then dial someone at the communications test center to diagnose it.

Diagnostic Tape

The Sycor serviceman can make the 340 at the communications test center transmit a diagnostic tape to him at the user site, and he can then load the appropriate program to test the unit's ROM, RAM, keyboard, cassette tape drives and mag tape.

The programs are designed to locate problems and notify the user through the CRT screen.

The Sycor spokesman said the unattended test station communicates in Ascii at 1,200 bit sec. The test center also plans to add 2,000 bit/sec Ebcdic capability.



'Custom' Reports Keep Remote Canneries Up-to-Date

SAN FRANCISCO – A data communications system provides daily management information reports to increase the efficiency of Del Monte Corp.'s far-flung California canneries.

The daily performance reports, produced in part from statistics generated from a centralized computer, give managers of remote canneries detailed statistical summaries of the previous day's business only two to four hours after the canneries transmit source data to corporate headquarters.

B.H. Sturm, administrative services manager for Del Monte's California Division, said, "Managing a cannery with up to 1,800 seasonal workers, buying from our 150 growers and adjusting to the whims of agriculture is a constant challenge to plant and division management. Monthly or even weekly performance reports are too infrequent to be of significant value."

California Division canneries use Singer 4300 Magnetic Data Recording Systems which transmit at a speed of 2,400 bit/sec over dial-up voice-grade lines to the corporation's San Francisco-based 370/158.

Benefits Gained

Among some of the significant benefits the division gained with its data communications system are:

- A six-times reduction in data input time from approximately two hours to 20 minutes for a larger cannery.
- An increase in data-transmission speed of 40 to 60%.
- Hard-copy return output within four hours maximum during the summer high season contrasted with 24 hours previously.
- Automatic data entry as a by-product of job assignments issued by foremen.
- Discontinuation of a 65K 360/30.

Each cannery is equipped with:

- One Singer Model 4331, 300 card/min reader for conversion of data onto magnetic tape.
- One Singer Model 4311, 7-track, 800 bit/in BCD code set, magnetic data recorder, which allows high-speed transmission of data over voice-grade lines.
- One Singer 4353, 125-line/min printer for producing hard-copy reports.

International Communications Corp. 2200/24 modems provide signal conversion at both ends, and a Memorex 1270 communications control unit serves as the final front-end interface to the System. 370 operating under Hasp.

Another benefit gained from the system is the avoidance of central office keypunching.

Rather than hand-post employee time cards for the subsequent keypunching in the canneries' data entry offices, foremen create computer-compatible time cards as a worker moves from one job to another.

Using a hand-stylus, or Porta Punch, foremen punch preprinted time cards with an employee's data such as: start time, skill (pay) bracket, variety of food, job category, can size, start-stop time for meals, final quit time and whether premium pay is due. Two job assignments may be so punched in one card. The data entry control card transfers with an employee when assigned to another foreman's operation.

The Singer Model 4311 magnetic data recorder also permits key entry for exceptions or special entries. For example, the first hard-copy return from San Francisco provides an audit listing of all input and indicates from program controls any mispunched or misread cards. Corrected cards may be read in or corrections made via the magnetic data keyboard.

A small volume of returned data, such as a hard copy of a new employee's data base, is printed on special-headed instead of blank forms. Such data is received on magnetic tape while forms are changed on the Model 4353 printer, thus minimizing transmission line use.

Raw Material Data

Data for raw material accounting also is processed through the division's Singer system. Disk-filed data bases are maintained in San Francisco pertaining to pertinent grower data; in addition, a commodity data base includes pay scales for varieties by grades. Once Del Monte takes possession of a truck load at state-approved receiving stations, weight certificates are generated and sent to a nearby Del Monte area office (which may support up to several plants) for keypunching.

User Casebook

Returned data advises canneries of weight-certificated poundage inputted daily. Berkeley Division headquarters receives copies of cannery data plus growers' consolidated checks for audit prior to forwarding to the grower.

Prior System

Predecessor equipment, IBM 1050 14 card/min readers, transmitted data to a Berkeley-based 64K byte 360/30. All hard copy was couriered back to canning locations approximately 24 hours after data input.

A Singer system, similar to that used by Del Monte's California Division, leases (on a three-year basis) for approximately $700/mo and sells for about $29,000 per communication station, exclusive of modems and line charges.

WU Revises Intercity Private-Line Rates

WASHINGTON, D.C. – Western Union (WU) has revised intercity private-line voice-grade rates to meet competitive prices for these services on high- and low-volume traffic routes.

The services involved include data communications and will mean increases for an estimated 10 out of 80 private-line customers, WU said.

In revising its rates, WU paralleled the action taken by AT&T in establishing a high/low rate structure.

Under the new WU rate structure, three pricing elements are established. These are interexchange mileage (distance between serving cities), channel terminals and station terminals (local distribution).

Comparative WU and AT&T rates under the revisions are:

- Interexchange mileage rates – high-capacity route, WU, 75 cents per mile/mo (57 locations). AT&T, 85 cents per mile/mo (370 locations).

  Low capacity route, WU, $1 per mile/mo; AT&T, $2.50 per mile/mo.
- Channel terminals – WU, $50/mo per service point for high- and low-capacity routes; AT&T, $35/mo per link end on high-capacity routes, and $15/mo per link end on low-capacity routes.
- Station terminals – WU, $25/mo and $5/mo for each additional extension at the same location; AT&T, $25/mo and $3/mo for each additional extension.

CRT Added to Lockheed System III

LOS ANGELES – An auxiliary video display unit that can be interfaced with the Lockheed System III business computer has been introduced by the Data Products Division of Lockheed Electronics. Addition of an auxiliary terminal to the System III increases throughput by providing a second workstation that functions simultaneously with the master video display control console.

The CRT terminal operates in either local or remote mode. The terminal functions in the foreground mode of the dual partitioned System III foreground/background Disk Operating System.

On-Line in Foreground

In a typical application, batch processing would take place in the background partition under the control of the master console display, while simultaneous on-line entry or inquiry would occur in the foreground partition using the auxiliary video display, the firm said.

The video display hardwired subsystem, including CRT and keyboard, interface, cables and software, is priced at $4,325 with delivery in 90 days. The remote unit is priced at $4,490 not including modem. The firm is at 6201 E. Randolph St., 90040.

T-Comm 7 Supports Hazeltine Terminals

BOHEMIA, N.Y. – Periphonics Corp. has added a terminal support module to allow its T-Comm 7 front end to operate with Hazeltine Models 1000 and 2000 CRT terminals. The Periphonics support module is said to permit use of all controls and options available with the Hazeltine terminals.

The software package is part of the Periphonics front-end operating system, Peri-Comm. The module can be added without the necessity of recoding any previously installed modules, the firm said.

The module costs $180/mo on a three-year lease from Airport International Plaza, 11716.

T/S Teleprinter Makes 6 Copies

TORRANCE, Calif. – Randal Data Systems has a 30 char./sec teleprinter for commercial time-sharing and remote terminal applications.

Called the Model 30 KSR, the impact mechanism can produce up to six copies with either sprocket or pin feed tractors. All installations are described as customized to the application requirements.

A range of versions is available with 132-column width, automatic paper tape reader and punch and receive-only versions.

Lease prices start at $96/mo, from 2807-F Oregon Court, 90503.

[redacted]

When Profit is Paramount

Effective Management Calls for Seeking Best Prices

By Vic Farmer
Of the CW Staff

STAMFORD, Conn. – A service bureau/time-sharing company is, after all, just a big data processing department. But unlike the data processing department a service bureau must turn a profit . . . and when "profit" is paramount a DP group must seek the "best bang for the buck."

Seeking this "best bang for the buck" has been an ongoing concern at National CSS (NCSS) here over the past five years.

NCSS hasn't used any secret tricks, unproven gimmicks, or taken high risks; the company just applied good business sense.

From a position of 100% IBM rental at the beginning of fiscal 1971, the firm is still using IBM mainframes but little else. And today only 44% of its computer hardware expense is tied to IBM leases.

Probably the biggest hit for NCSS was the third-party lease of an IBM 370/168 which was installed at the beginning of this year. The firm was able to convert its VP/VSS virtual memory operating system from 360/67 based CPUs to the 370 line.

At first the firm only expected to be able to replace three of its 360/67 CPUs. A 370/145 was rented just to ease the conversion effort and NCSS needed the 145 for only six months.

Returned 67s to IBM

Three months after the 168 was installed NCSS did indeed return three 67s to IBM, and just one month later the firm was able to return another 67.

Within the next four months, the firm is planning to tack on more peripherals to the 168 and expects the full-blown configuration will allow the elimination of one more 67. David Fehr, NCSS' vice-president for computer operations, calculated the 168/67 price-performance ratio at about 2.5:1. Or in more specific terms five 67s cost 2.5 times more than one 168, at least for NCSS to perform about the same work.

The success of the 168 conversion will give the firm an additional 30% to 40% daily capacity for the same price within a year of the 168 installation, Fehr said.

"In the past five years we have spent over $24 million for data processing and communications hardware," according to Fehr. NCSS was able to show a consistent year-by-year improvement in the hardware expense-to-revenue ratio because the firm was willing to take "prudent business risks eschewing the very conservative IBM straight rental approach," Fehr explained.

Beginning of fiscal:	1971	1972	1973	1974	1975
% IBM (rental)	100%	85%	51%	52%	44%
% Independents	–	15%	17%	22%	22%
% IBM lease (third party)	–	–	32%	18%	25%
% Purchase (AMS)	–	–	–	8%	9%

NCSS spread its hardware money over a number of cost-effective options.

Fiscal Year	1971	1972	1973	1974
Revenue (in millions)	7.8	11.1	16.6	23.7
Hardware Expense *(in millions)	4.3	4.7	5.7	7.8
Hardware Cost as % of Revenue	55%	42.6%	34.3%	32.9%

* Includes both data processing and data communications hardware.

Hardware cost alternatives are reflected in NCSS's hardware expense vs revenue history.

Cost reduction started in late 1970 (mid fiscal '71) when NCSS began to replace IBM disk drives with Memorex equivalent units.

"With 248 separate modules installed, we were probably Memorex's largest, nongovernment customer," Fehr said. The Memorex drives' cost is 52% of the IBM rental price for equivalent units.

In 1972 NCSS began installation of 10 Advanced Memory Systems' main memory units which replace an equivalent number of IBM core devices.

"In combination with IBM core obtained as part of third-party leases, we were able this year to return the last of our IBM rental devices," Fehr said.

In one year this move achieved a savings of $1.1 million over the same capacity from IBM on MAC basics, Fehr added. The firm has four other 67s on a third-party lease.

"The effective rate of the 360 lease is approximately 50% of IBM rental, and during the last year we realized savings of $1.5 million by leasing," Fehr said.

The 370/168 has 4M bytes of main memory, nine of the 12 possible channel positions utilized, and has 400 phone-access ports. Forty spindles are attached to the 168 and presently are broken up into 28 3330s, four 3330-11s and eight Memorex 3670 (3330-type) drives.

The peripherals from IBM are on MAC but in the next several months NCSS will convert to third-party leases or keep the IBM gear – but on a two year fixed-term plan.

The firm categorizes the system as one of the largest 168 configurations in existence. NCSS is now evaluating the addition of a 370/158 perhaps by the end of this year. But Fehr said the exact throughput and price performance of the 158 cannot be predetermined, but should be attractive in comparison with a 360/67 although less dramatic than the 168 acquisition.

Consolidated Computer Offers Small Key-to-Disk

WALTHAM, Mass. – Consolidated Computer, Inc. is now offering its Key-Edit 50 key-to-disk system in this country.

The up-to-16 station system was previously sold on an OEM basis only to ICL Ltd., UK, and Fujitsu of Japan.

The Key-Edit 50 features communications capability to interface to remote mainframes concurrent with data input.

An input editor identifies and displays operator input errors and traps any errors when they are keyed, and an output editor performs a higher level of error checks, together with data reformatting.

The Key-Edit 50 enables average operators to attain keying rates of 20,000 keystroke/hr and is designed to satisfy the needs of the four to 16 terminal user, according to the firm.

Data is entered in record sizes of up to 240 characters to a disk under the control of a minicomputer. An individual input program provides format control, data type definition, level of automatic dup/skip and check digit definition.

The system allows up to nine different record formats and 99 different check and balance routines per document. Data resident in the disk can be reformatted to meet mainframe standards before output.

Data output, controlled by the output editor, is automatic without supervisory intervention, or conditional and under control of a system supervisor. Any combination of verified, balanced, and tape formatted data may be specified as a prerequisite for output.

Operator/batch statistics can be initiated on any batch or operator, while the 50's file management feature allows data batches to be grouped as one single file.

The previously announced Key-Edit 100 handles up to 32 terminals and a soon to be announced Key-Edit 1000 will handle up to 64 terminals under the control of one central CPU.

A typical 50 configuration including 12 stations is priced at $1,300/mo with maintenance at $200/mo for the system and $15/mo per terminal. Terminals rent for $85/mo.

The minimum configuration of four terminals including maintenance and tape drive is $820/mo. The Canadian firm's U.S. office is at 275 Wyman St., 02154.

AM Alternate Source For 1710 Ink Roller

SCHAUMBURG, Ill. – Replacement ink rollers for the Univac 1710 verifier interpreter punch and other equipment that uses the Univac 0769 incremental printer mechanism are available from Addressograph Multigraph Corp. for $5.75 per box of six. The firm is at 1834 Walden Office Square, 60172.

Available Peripherals Reviewed

LEXINGTON, Mass. – GML Information Services is now publishing a *Peripherals Review*, a guide to minicomputer peripherals, IBM-compatible peripherals, and OEM peripherals from independent manufacturers.

The review contains sections for disks, drums, floppy disks, magnetic tape units, cassettes, printers, card readers and punches, and paper tape equipment from over 90 independent manufacturers.

Each section of the guide provides the user with:

- Equipment characteristics and prices in a tabular format for easy look-up and comparison of equipment specifications.
- An interface chart which shows the minicomputers to which peripheral devices may be interfaced.
- A list of plug-compatible peripherals and the corresponding IBM product.
- Directory of manufacturers.

Peripherals Review is published three times a year and costs $39 from the firm at 594 Marrett Road, 02173.

729s Match Mini

LOCKPORT, Ill. – Up to eight IBM 729 tape drives can be connected to a DEC PDP-11 minicomputer with Kineticsystems Corp.'s Model 90 interface. The interface is compatible with DEC's TM-11 controller and can be used with DEC software, which supports industry-compatible tape, the firm said.

The firm is at Maryknoll Drive, 60441.

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Here's just one of many examples: A large midwest company had 100 different groups within the company spending as much as $60,000 a month with 11 different outside time sharing services. Now they're transferring their programs to DATANETWORK in anticipation of installing their own Honeywell system. They expect to save nearly 50%. What's more, when their computer arrives, they'll be off and running almost immediately because of GCOS compatibility.

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A heavy duty card punch at the betting parlor provides a copy of the bet for both the bettor and the track.


The cards from the betting parlors are brought to the track and input before each race. Cards that miss the deadline are void.


Data processing manager Pablo San Gabriel examines an itemized list of the bets (known as *Hoja de Cotejo*).

From Remote Parlors

Bets Raced to San Juan Track

SAN JUAN, Puerto Rico – The off-track betting at El Comandante racetrack near here uses an advanced, computerized system unique among horse-racing tracks throughout the world.

For a bet as low as 25 cents, a horse-racing afficionado can win a pool totaling as much as $100,000 by picking six winners from the second through the seventh race.

The off-track betting system begins with a bettor going to his local betting agency and either orally stating his choices or presenting a piece of paper with his selection written on it. His selection is keypunched using a specially built ICL Ltd. keypunch. The punching dies are strong enough to penetrate two copies. One copy is given to the bettor as his receipt.

The other part is then physically transported by car or airplane to the computer center at the track. In one case, the betting agency is located 18 miles off the coast on the island of Vieques, necessitating a daily launch to bring the cards to the mainland.

The owner of the agency or his representative must bring all the cards to the computer center by the deadline of 1 p.m. Sufficient time must be given to process all the cards before the first race begins at 2:15 p.m. If the cards are received after 1 p.m., they are declared null and void.

The punched cards are issued to the agencies by the San Juan Racing Association with serial numbers already keypunched on the card. Records of the serial numbers and the agencies receiving them are kept by the association to guard against fraudulent use.

The period from noon to 2 p.m. on racing days at the track's DP center is one of furious activity as the agency representatives hand in batches of punched cards to tellers at 10 windows. Each teller is assigned responsibility for handling 55 agencies (there are 555 betting agencies).

The agency also presents the teller with a check to cover the bets.

Cards Entered

The cards are checked by the tellers, then entered in batches into a battery of six 1,300 card/min Univac card readers. Any torn or crumpled cards are extracted and rekeypunched on the track's Univac 1700 keypunches before being inserted into the card readers.

In addition to the card readers, the complete computer system at El Comandante consists of two Univac 9400 processors, each with a main memory capacity of 64K bytes, three 1,600 line/min printers, four disk drives with a total capacity of 116M bytes, one card punch and two magnetic tape units. Five of

(Continued on Page 27)

Off-Track Betting System a Winner in Puerto Rico

(Continued from Page 26)

the card readers can be switched between either processor.

Only one computer is needed to process the transactions; the other is a backup system.

On an average race day 160,000 to 170,000 punched cards are processed between 1 p.m. and 2 p.m. If for some reason the computing work is not finished by the scheduled start of the first race in the pool, that race is held up until the DP task is completed.

Four different types of punched cards, each one color-coded, are processed by the computer. Two of these are not valid for pool betting. They are the Exacta – used by bettors wishing to pick the winner and a place horse in the eighth race – and the Dupleta – used for picking a winner in the fifth and sixth races (similar to the daily double in the U.S.).

The other two cards – the Papeleta and Caudro – are the ones used to wager on the pool. The Papeleta is a single bet per race and a Cuadro a multiple bet which allows the bettor to pick as many horses in each race as he likes.

For each combination the bettor pays 25 cents. Those who pick all six winners divide 60% of the amount bet in the pool and those with five winners split the remaining 40%.

Rigorous Puerto Rican government supervision is carried out throughout each stage of the computerized betting procedure. Each race day an inspector stays in the computer room and periodically examines the information being printed out. The track records are also audited by the government.

When all the cards have been processed, lists of the bets (*Hoja de Cotejo*) are printed out in triplicate. One copy goes to the appropriate agency, the second to the government, and the third is the track's copy. The printout shows the serial number of each card, the agency number, the horse selections, the total cards by type, total cards booked by each agency, and the total amount of the pool.

The computer also updates the master file of the agencies and prints out an index to the betting lists.

After the total dollar volume of the pool is computed, it is announced and displayed before the races begin. On two recent occasions, the pool total has exceeded $300,000.

When the seventh race is finished, race results are fed into the computer, which then performs a rapid scan to determine the pool winners, followed by a calculation of the pool distribution.

According to Pablo San Gabriel, DP manager for the track, the scan can be completed in 45 seconds on the 9400.

"Before we used computers," San Gabriel noted, "it took a full day to come up with the information on the winning bettors."

In addition to finding the pool winners, the computer also produces the winners for the Exacta and Dupleta races.

A winner's list is printed in serial number and agency sequence and given to the cashiers. Bettors bring their copy of the punched card as verification to the cashier windows and receive their winnings. At the same time, the computer updates the list of previously unpaid bets with the new winners.

The punched cards are kept for six months after their date of use before being discarded in case any complaints should arise.

The computer performs the accounting work for the agents, provides them with a balance sheet showing their daily commissions and how much money they owe the track. Every race day the agents receive a settlement ticket showing bets.

In addition, the computer system prepares daily, weekly and monthly reports on revenues and profits with comparison reports going back four years. The reports are plotted on a month-to-month and year-to-year basis by agency and type of bet. Other tasks include preparing the payroll for employees of the association, general accounting, and horsemens' accounting, including disbursements to jockeys and horse owners.

Excess capacity on the computer on nonracing days is now being used for a service bureau operation. The applications for clients include payroll, general accounting, cost accounting and inventory control.

Seven Decsystem-10s To 'Put the Heat' On 2-Story Building

COLUMBUS, Ohio – Heat discharged from seven Digital Equipment Corp. Decsystem-10 computer systems at Compu-Serv Network Inc., a data services firm, will be conserved to provide over 90% of the energy required to heat the firm's new 30,000 sq-ft administration building.

The new two-story structure will adjoin Compu-Serv's existing 20,000 sq-ft computer center.

Heat from the computer center presently is removed by a 90-ton air conditioning system, cooled in water-holding tanks and discharged in the air. The new heating system will transfer hot water to the administration building where heat will be released through a heat exchanger and distributed throughout the structure.

Backup Heat

The computer systems generate about 120,000 BTUs per hour and the new building will require 130,000 BTUs during Columbus' coldest nights, according to architects. A backup electric boiler also will be installed in the administration building.

Construction for the $2 million project, which includes revamping the existing computer center and purchasing additional computer hardware, began in mid-June and is expected to be finished by next spring.

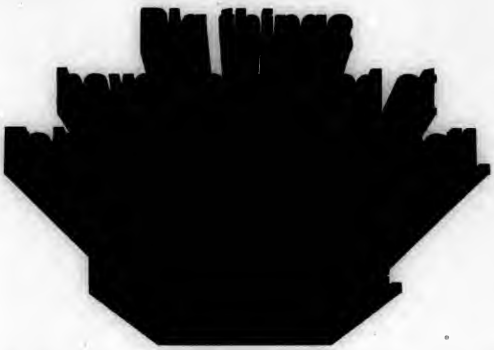
The Decsystem-10s each have a core memory in excess of 128K 36-bit words. PDP-15s are used as control processors, while PDP-8s and 11s are the front-end processors. Mass storage is provided by RM10B fixed-head drums and RP02 and RP03 disk drives. Ampex ARM-10 memory units are presently being added to the mainframes.

Terminal Eliminates Header Card

BEDFORD, Mass. – ECRM, Inc. has enhanced its Autoreader line of OCR equipment with the addition of a CRT terminal and new software.

The combination enables operators to use the terminal instead of header sheets to modify the system's output for different typesetting equipment, different keyboard layouts and new applications.

The terminal enables operators to examine the instructions stored in the computer and to make permanent changes. Software is free to Autoreader users; the terminal costs an additional $4,000 from the firm at 205 Burlington Road, 01730.



Great Lakes Network Links Ships to Home Offices

LORAIN, Ohio – A computer here will eventually be used to direct automated ship-to-shore communication in a radiotelephone system on the Great Lakes.

Designed to be less susceptible to interference than the existing radiotelephone network, the system is being developed by Lorain Electronics under contract to the Federal Maritime Administration.

In addition to carrying conventional calls between commercial vessels and their home offices, the computer will automate a variety of communications functions, according to a Lorain Electronics spokesman. He said the Varian 72 will be used to gather information from ships moving on the lakes and broadcast weather information regularly to subscribing vessels.

Operating in the capacity of an interconnect carrier, Lorain Electronics will provide radio links for communications traffic moving to or from the telephone network, the spokesman commented.

Initially, six shore stations covering all or part of Lakes Superior, Michigan and Erie will be established. He noted that while the radiotelephone network will experience less interference, the range of each shore station will be considerably less. Eventually, 14 stations will span all five lakes, as a result.

Two Different Lines

Stations will be unattended, the spokesman said. Each will relay traffic over two different lines: a dial-call line from the local telephone company and a leased line between the shore station and the system's central, attended station at Lorain where the computer is housed.

The dial-call line will carry individual calls between a telephone subscriber, such as a shipping company, and a vessel under way. The subscriber will dial an appropriate number, and, according to the company representative, the shore station will automatically establish a radio-frequency link to the ship he wants to contact.

The only role the central office and the computer play in such a call will be to record the origin, destination and duration of the call, he added. The company plans to use this information for billing.

The computer will be used to poll all subscribing ships every few hours to gather such information as ship position, course and speed, local weather conditions, estimated time of arrival and coded-word messages for the owner.

Authorized callers – the ship's owners and the National Weather Service – will have access to this stored information on demand by dialing the central station, the representative noted.

He added that by keeping track of each ship's progress, computer operators will know which shore station to use in contacting a ship at each polling.

Every six hours, the computer will be programmed to clear the system of message traffic, activate all shore-station transmitters and broadcast the weather report, the spokesman said.

Lorain Electronics may eventually add some background functions such as invoicing to its software package. The spokesman commented that these functions would be handled while communications functions are going on in the foreground.

1130 Supplements Drafting Table

WEST COVINA, Calif. – A computer at Alco Engineering Co. has reduced by one half the amount of time required to prepare the detailed drawings that guide fabricators of structural steel columns and beams.

Alco Engineering is a firm that translates the general architectural design plan of a structure into the specific drawings that show the dimensions of the individual steel members and the connecting fittings of a building's framework.

At Alco Engineering, much of the repetitive work involved in the detailing process is now handled by an IBM 1130 computer and a 1627 plotter. The system calculates the dimensions for each stell member and then produces a drawing with the measurements printed alongside.

Al Young, who founded the small firm a decade ago, said he used to turn away work because of a chronic shortage of qualified detailers.

"Now, with the help of the computer, the time to prepare a typical detail sheet on a drafting table is cut by approximately 40%, and we can increase our output," Young said.

"Our detailers are freed from the routine part of the job and can concentrate on the technical aspects, like preparing the data for the computer and adding the customized details to the basic drawings."

Calendar

July 18-19, Boulder, Colo. – Twelfth Annual Computer Personnel Research Conference, sponsored by SigCPR. Contact: Bureau of Conference and Institutes, Academy 217, 970 Aurora Ave., University of Colorado, 80302.

July 23-26, Mexico City – Fourth Annual International Computer Exposition for Latin America. Contact: National Expositions Co., Inc., 14 W. 40 St., New York, N.Y. 10018.

July 29-Aug. 1, Jerusalem – Second Jerusalem Conference on Information Technology. Contact: Arnold B. Schaknow, Macro-Pak Business Systems, Inc., 4 Lawrence Court, Syosset, N.Y. 11791.

Aug. 5-7, Jackson, Wyo. – 1974 Annual Meeting of the National Association for State Information Systems (Nasis). Contact: Sandy Humston, Nasis, P.O. Box 11910, Lexington, Ky. 40511.

Aug. 5-10, Stockholm – Ifip 74 and Medinfo. Contact: U.S. Committee for Ifip Congress 74, Box 426, New Canaan, Conn. 06840.

Aug. 12-14, Stockholm – Second International Conference on Computer Communications. Contact: Edward E. Boyar, 1860 Wiehle Ave., Reston, Va. 22090.

Aug. 13-15, Bellingham, Wash. – 1974 Summer Adcis Meeting. Contact: Barbara Farquar, Laboratory for Computer Science, Massachusetts General Hospital, Boston, Mass. 02114.

Aug. 13-15, Copenhagen – Second International Joint Conference on Pattern Recognition. Contact: E. Backer, Electrical Engineering Department, Delft University of Technology, Delft, The Netherlands.

Aug. 13-15, Pittsburgh, Pa. – Institute on Hybrid Microelectronics. Contact: Minor C. Hawk, 321 Benedum Engineering Hall, University of Pittsburgh, 15261.

Aug. 19-20, Montreal – Urisa SigGBF Workshop. Contact: Mike Weaver, Systems Development Corp., 301 S. McDowell St., Suite 116, Charlotte, N.C. 28204.

Microfilm Trims Paper 'Waste'

SPRING VALLEY, N.Y. – A natural gas and electric utility company here has conserved more than 100,000 pounds of paper each year since it began printing computer reports on microfilm instead of paper.

Orange and Rockland Utilities, Inc. stores the equivalent of more than 1.8 million pages of records, two years of billing and accounting records required by the New York Public Service Commission, in 70 microfilm cassettes, according to a company spokesman. The cassettes are housed in one filing cabinet, he added.

The company uses a computer-output-microfilm (COM) unit to put its records onto microfilm. The unit is actually in use about 30 hours each month, printing 200,000 customer billing records, general accounting records and some engineering data, the spokesman said.

Manufactured by the Memorex Corp., the device operates as a standard peripheral unit attached to the utility's IBM 370/145 and prints 132-character lines at speeds up to 10,000 line/min directly onto microfilm.

A one-code program instruction stored in the computer instructs the CPU to print output in the form of microfilm instead of paper, the spokesman noted.

COM-generated reports are read through automatic desk-top viewers, which enlarge microfilm images 24 times on an 11 in. by 14 in. screen, he said.

He commented that if the utility's two-year supply of records were printed on paper, some 1,080 sq ft of floor space would be required to house the records in conventional five-drawer filing cabinets.

In addition, filmed data can be viewed two thirds more quickly through automatic viewers than hard-copy reports can be read in binders, the spokesman explained.

This Patient Won't Complain About a Poor Bedside Manner

LOS ANGELES, Calif. – Sim One can be a very difficult patient, choking, vomiting, bucking and even going into heart failure at the most inopportune times. It can even go into shock and die.

Fortunately, though, it can always be brought back to life.

Sim One is a computer-controlled manikin which simulates a living person, breathing with its chest and abdomen, having an audible and tangible pulse and responding to medication.

The manikin has all the organs normally found in a patient – tongue, teeth, epiglottis, aryepiglottic folds, vocal cords, trachea, esophageal opening and bronchial tubes.

Developed jointly by University of Southern California medical researchers and engineers at Aerojet-General Corp.'s Von Karman Center, the six-foot manikin is a training aid for resident physicians in anesthesiology at USC's School of Medicine and is now being made available to others.

Sim One could be the first of a whole generation of medical simulators, USC's researchers believe.

"A wide variety of medical skills can be taught effectively and perhaps more quickly with the use of simulators than by any other means," said Dr. Stephen Abrahamson, coordinator of the manikin project.

The USC School of Medicine has been using Sim One since 1968 for training anesthesiologists in the techniques of intubation – inserting a tube down the throat and between the vocal cords.

This particular learning mode was chosen, according to Abrahamson, because it requires a very complex and sophisticated application of computer science, because intubation is a relatively brief procedure and because the maneuver can be divided into readily identifiable steps.

In the development of the patient-simulator, all normal physiological responses were reduced to mathematical equations so that programming would cause the manikin to respond exactly as a human patient would to various stimuli and drugs.

Aerojet-General programmed the manikin's human-like reactions and responses into an Electronic Associates, Inc. Hybrid 2400 computer composed of an EAI 231-R analog and DDP-24 digital computer made by Honeywell.

While a student is learning on the manikin, the instructor monitors the procedure at a control console.

The instructor's console displays identification of drugs, volume injected, the effective levels of all drugs acting on the manikin, the flow of gaseous agents, the depth of anesthesia and the position of the airway tube in the trachea (throat and upper chest).

If he wishes to talk with the student, Abrahamson said, the instructor can stop the procedure at any point for as long as desired and then resume from that point or start all over again.

The instructor can also override the automatic responses of the computer to introduce problem situations such as increased heart rate, severe spasms, closing of the larynx or a block in either bronchial tube.

"The educational potential of the simulator is enormous," Abrahamson declared. "Not only is the system designed to allow us to halt the procedure at any time, but we can also call upon the computer for a printout of precisely what has taken place up to that point.

"Or we can wait until the procedure is completed and then review a time-sequence readout of everything that happened to the manikin."

Perhaps the greatest value of the simulator, Abrahamson said, is its ability to demonstrate and repeat as often as desired the emergencies which an anesthesiologist must be prepared to handle but sees only rarely in actual practice.

In a controlled experiment designed to achieve nine out of 10 consecutive professionally competent intubations in live patients, students trained on the simulator required 45.6 days, while the control group required 77 days, Abrahamson said.

Reduces Customer Complaints

Meter Ordering System Turns Gas On and Off Quickly

By Gerald C. Miller
Special to Computerworld

BUFFALO, N.Y. – After a single phone request from a customer, Iroquois Gas Corp.'s computer-based Meter Ordering System (MOS) helps turn the gas on or off in the customer's residence with a minimum of confusion and delay.

And while the system is speeding a serviceman on his way, it is automatically generating all records for the transaction.

The on-line system has virtually eliminated customer complaints caused by inability to fill meter orders during peak demand periods.

When a customer wants to stop and/or start up gas service, he simply places one phone call, handled by one of 10 clerks at the Mineral Spring Distribution Center. Clerks sit at IBM 3270 display terminals, directly on-line to an IBM 370/145 computer at Iroquois' downtown Buffalo data processing center.

Using the display station's keyboard, the order clerk enters the customer's service address, name, phone number, dates and times of requested service, etc. The viewing screen, in turn, displays the file data needed to generate a final bill, dispatch a serviceman, and start a customer file at a new location – including the past pay history and deposit requirements.

If the date on which the customer requests service is more than 80% booked, the computer consults its schedule file and automatically generates a series of alternate dates on the terminal's screen, indicating for each the percentage of a full day's work that has already been scheduled. This allows the clerk to suggest realistic work-completion dates and assures the customer that a serviceman will actually be there on the scheduled date.

Before installation of the on-line MOS, approximately 150,000 meter orders were called in to Iroquois' commercial offices. Since the offices had no knowledge or control of the workload, the company would receive up to 4,000 orders during peak periods requesting service for the *same* day. Even allowing for generous amounts of overtime, it was impossible to schedule more than 40% to 50% of the orders for completion on a given day.

The 1971-announced federal and state gas safety standards, which mandated numerous on-premises inspections of distribution facilities in public and private buildings was the catalyst for the new system. With more than 454,000 meters installed, the new standards would have required the firm to make approximately 64,000 extra inspections each year.

However, Iroquois servicemen were already completing nearly half a million customer calls each year. So the company felt it could combine many required inspections with meter and service calls, and still comply – at minimum added expense – with the new regulatory requirements.

Iroquois quickly realized that to translate this concept into reality would require the development of a fully integrated, computer-based order-issuing capability and a related customer-information system. Based on this premise, a long range plan was formulated to:

- Develop a computer-stored cross reference file – accessible by service address – enabling the company to relate selected customer-billing information to distribution operations.
- Devise a computer facility for entering, storing, scheduling, printing, and dispatching customer meter orders.
- Do the same for customer service orders.
- Expand the data base to include dates and addresses of specific inspections.
- Develop a separate inspection criteria file, which based on a scan of the file, would print inspection instructions on servicemen's orders in accordance with preprogrammed inspection criteria.

By separating complex billing and inquiry procedures from relatively simple meter-order functions, the firm has been able to use less experienced personnel for meter-order entry, thus improving the overall cost/performance for all display operations.

On Viewing Screens

A series of programmed viewing screens take the operator through either the "close" (lock – turn off a customer's gas and generate a final bill) or "open" (unlock) order-entry procedure. All that's needed from the operator to process an order are simple keyboard responses, such as dates of service.

Duplicate and multiple orders that plagued the firm in the past are automatically pointed out, as are calls by customers trying to pose as "new" accounts after having been shut off for nonpayment.

Meter orders entered during the day are stored in the system until midnight before the day the order is to be executed. At that time, orders are printed, sorted, dated and routed for dispatch next day – all with a minimum of manual effort.

At day's end, orders dispatched during that day must be re-entered into the system, whether they were completed or not. Meter servicemen return order slips to the terminal operators, who then follow a simple procedure to key in completion data for file records.

In March 1973, Iroquois incorporated a "schedule" file into the system which assigns an exact completion date to all meter orders. More than anything else, this unique feature has resulted in a vast improvement of the system's efficiency and of customer service.

'Priority' Syatem

Before computer scheduling, the company had a "priority" system, in which each serviceman was assigned 25 meter orders each day and was told to give the unlocks first priority. In practice, this meant he'd complete perhaps 15 orders – mostly unlocks – and bring back 10 orders, or 40%, as "did not reach."

With our on-line system, we can schedule an exact workload and time, and route the servicemen by grid area regardless of the job. As a result, we've reduced "did not reach" orders to a low 5%, while cutting unnecessary traveling time.

Gerald Miller is superintendent of utilization at Iroquois Gas Corp.

COMPUTER INDUSTRY

CI Notes

NCR Lands Scanner Order

LAKELAND, Fla. – NCR has received its largest order for scanning systems from Publix Super Markets, Inc., which plans to convert half of its 180 stores to automatic scanner checkouts within three years.

The order includes about 900 terminals and NCR 782 scanners and 180 NCR 726 in-store computers.

Installation of the scanning systems is scheduled to begin in mid-1975. NCR has begun installation of the 255 systems without scanners at Publix stores.

CDC Unit Picked for Samson

OTTAWA, Ont. – Computing Devices Co., a division of Control Data Canada, Ltd., has received a contract valued at over $6 million for intelligent terminals. The equipment will be used by the Department of National Defense as part of Project Samson.

The terminals will be installed in about 150 communications centers across the country and in Europe, and will be produced by Computing Devices at its Bells Corners plant in cooperation with the Kleinschmidt Division of SCM Corp. Deliveries will begin in mid-1975.

Univac Hatching 90/40

BLUE BELL, Pa. – The next Univac mainframe is expected to be the Series 90/40, designed to be an upgrade for present 9400 users.

Supershorts

Qantel Corp. has signed distributors in Seattle, Denver, Cedar Rapids, Omaha and Kansas City.

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IBM's quarterly cash dividend will be $1.50 a share, an increase of 22 cents over the previous dividend. It is payable Sept. 10 to shareholders of record Aug. 14.

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Datum, Inc. has appointed Ashworth Automation, Ltd. to handle the distribution and service of Datum peripherals in Canada.

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University Computing Co. has signed Upjohn Co. as its 100th customer for UCC-One proprietary tape management software.

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General Automation, Inc. has formed a subsidiary called G.A. Computer Ltd. to provide sales, services and software support operations in Canada.

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Three software systems from Tesdata Systems Corp. have been included in the General Services Administration ADP Schedule: Deadline 11, Streamline and Bottomline.

Agencies Consult Listings

GSA Rule Opens Door to Third Parties

By Nancy French

Of the CW Staff

WASHINGTON, D.C. – The General Services Administration (GSA) has issued a new federal procurement management regulation that will open the door for the first time to large-scale business between federal agencies and the third-party industry.

Under the new regulation, no federal agency may purchase computer equipment from GSA's ADP Schedule without first ascertaining whether the desired equipment is available "elsewhere in the marketplace" at a lower price.

The rule became effective July 1.

The new regulation (E-32) affects three types of procurement: renewal of leased equipment, lease-to-purchase conversion and new acquisitions in which a central processing unit is involved, according to a GSA official in the ADP Procurement Division.

Under the regulation, third-party firms have been requested to submit on punched cards, or on forms ready for keypunching, descriptions of computer equipment by make and model number that they can make available to the government during fiscal year 1975. This information will form GSA's master list of equipment "available elsewhere in the marketplace."

Only equipment not on that list will be exempt from competitive bidding during fiscal 1975, according to the regulation, and if the system works well, a GSA official explained, similar restrictions will be placed on the ADP Schedule for 1976.

Under the new regulations, federal agencies will be prohibited from:

- Renewing installed leased equipment without competitive bid.
- Exercising their purchase option in lease-to-purchase conversions without competitive bid.
- Acquiring any new equipment involving a central processing unit directly off the ADP Schedule without competitive bid.

In reaction to the new regulation, Jim Benton, executive director of the Computer Lessors Association, said, "For the small suppliers to the government and for companies who own 360s and 370s, and who deal in leased equipment, this is exceptionally good news. We can offer these systems to the government at substantial savings – probably as much as 50%."

Original Requirements

GSA's original plan called for the third-party industry to supply serial numbers in addition to make and model numbers for the inventory list to assure that the equipment being offered actually existed. A penalty clause was also proposed, which prescribed removal from the list the name of any supplier who twice offered and then could not deliver equipment at an agreed price.

These requirements brought strong opposition from brokers who have no actual inventory but who obtain equipment after it is quoted. The penalty clause and the serial number requirement were omitted from the final regulation.

The precise types and models of equipment still available from the ADP Schedule will depend upon what type of inventory the third-party firms submit.

In a related matter, a regulation discussed earlier this year to give third-party maintenance companies a better shake with the government has been abandoned for fiscal 1975.

Wage Hikes Exceed 1973 Profits For Several Japanese DP Firms

By Edith Holmes

Of the CW Staff

TOKYO – Six mainframe manufacturers in Japan indicate labor cost increases during fiscal 1974 will exceed net profits realized during fiscal 1973, according to *EDP Japan Report* (EDP J/R).

Final wage settlements for employees of computer equipment makers increased an average of more than 33%.

Wages for Fujitsu, for example, will increase by 33.5% during fiscal 1974, resulting in a $50.1 million increase in labor costs.

In 1973, the firm earned $31 million.

Hitachi must absorb a similar rate of increase, paying an additional $134.3 million for labor during fiscal 1974.

Hitachi earned $50.7 million in 1973, the report said. (EDP J/R calculates prices in the conversion rate of 300 yen to $1.)

In addition to rising labor costs, computer manufacturers must face increasing materials costs. Prices of some items have risen an average of 30% since the oil crisis.

Not Until IBM

While a price increase might seem in order, mainframe manufacturers decided not to go this route except in limited product categories, since IBM has not raised its prices, EDP J/R said.

The report quoted Fujitsu officials who said prices of computer equipment, which constitutes more than 60% of the company's total sales, cannot be raised until IBM Japan increases its prices.

Strategies are being implemented by the six companies to absorb increasing costs as long as possible, according to the report.

"Unprofitable product lines will be curtailed, material procurement methods are going to be reevaluated and organizational structure will be improved in order to make the most efficient use of man-

(Continued on Page 32)

IBM Sued by Former Defendant In Trade Secret Theft Action

SAN JOSE, Calif. – Phillip J. Kronzer, a former defendant in an action filed by IBM charging 11 persons with theft of trade secrets, has filed a suit against IBM for $161.5 million on charges of malicious prosecution.

The suit is the third in a series filed by persons charged with involvement in the trade secrets case. The other two actions seek $17 million and have been filed by Brunhilde MacNevin, also a former defendant, and Ramon Serrata, a former IBM engineer, who is scheduled to be tried Oct. 7.

Kronzer's suit, filed in U.S. District Court here, seeks $1.5 million in compensatory damages and $160 million in exemplary damages.

IBM said it believes the suits are without merit.

Charges against Kronzer, vice-president of K&K Manufacturing Co., were dismissed in April, which means the district attorney cannot bring any new charges against the defendants for IBM trade secret violations even if new information is gained.

Charges have also been dismissed against W.O.J. Arnold, president of now-defunct Memory Magnetics International, and two draftsmen, John Sueta and Thomas Rauscher, because of insufficient evidence [CW, April 17].

When asking that charges against Kronzer be dropped, deputy district attorney John Marshall noted any information within Kronzer's possession at the time of the indictment "came into his possession properly." K&K manufactured for IBM the 2314 carriage assembly.

French Market Scheduled to Jump 20%

By Toni Wiseman
Of the CW Staff

PARIS – The computer market here is estimated for year-end 1974 and 1975 at $5.4 billion and $6.5 billion respectively, or a 20% increase, according to the Commission Permanante de l'Electronique du Plan (Copep) in a report submitted to the French government.

Copep, according to an article in the French DP publication *Zero Un Informatique*, predicted the installed base of computers, excluding micros, would reach 11,000 units by the end of this year, and 12,400 by the end of 1975.

The report predicted a consolidation or "squeezing" of the market, particularly with reference to medium-size machines (between $300,000 and $1.4 million).

Deliveries for this range of machine will drop from 500 units in 1974 to 460 in 1975, with the total delivery value for the year decreasing from $315 million to $252 million by the end of 1975, the report said.

Deliveries of large machines, on the other hand, will total 210 by the end of 1974 and 300 for 1975, with total values of $609 million and $840 million respectively, the report said.

Small systems figures are projected at 2,500 deliveries for 1974 and 2,600 for 1975, with a delivery value increase from $336 million to $357 million.

Very small machines ($10,000 to $50,000) and micros (less than $10,000) will surpass all other systems in number of installations. The number of installed micros is estimated by Copep to be around 15,000 this year and 19,000 by the end of next year.

During the same period, the number of very small systems will change from 22,000 to 27,000.

In an analysis of the market, Copep found data entry equipment accounts for 8.3%; printers, 11%; disks, 19.5%; tapes, 12%; terminals, 32%; memory, 22% and CPUs, 1.42%.

UK Trade Board Urging Firms To Penetrate Japanese Market

LONDON – The British Overseas Trade Board is actively encouraging UK firms to establish themselves in the Japanese market, according to *Computer Weekly*.

Promotional developments include an exhibition which will be held next February in Tokyo, designed to provide UK firms with an opportunity to introduce themselves to the Japanese industry, the article said.

International News

In a report prepared by the trade board, each product group is analyzed as to market potential, expected growth rate and competitors, both local and foreign.

Software, the report said, is an exciting field since the largest Japanese software houses have no more than about 200 employees and the bulk of the $480 million annual sales by the Japanese industry comprises software for specific systems rather than marketable packages.

Hardware, Too

Hardware is also a likely market, the report stated, with IBM holding only 29% of the market and Univac 10%; six Japanese firms hold the other 61%.

Total value of production by the Japanese industry in 1972, including foreign-owned manufacturers, was some $1.6 billion, with peripherals representing about half. Imports in 1973 amounted to $288 million with peripherals representing some $168 million.

The report cited CRTs, key-to-disk systems, minis and POS equipment as the markets with the best growth potential, all of which, it said, should grow by 50% over the next few years.

Japanese Mainframers Face Zooming Costs

(Continued from Page 31)

power," *EDP Japan Report* said.

However, some Japanese computer manufacturers, as well as importers of foreign-made machines, have decided to raise prices of small-size computers selling for less than $33,000. Price increases in this area of the market are possible because no direct competition from IBM exists, the report said.

Hardware Prices Rise

Average hardware purchase prices have increased 10% for Hitachi's Hitac 5 and Hitac 55, for example. The report noted Digital Equipment Corp. increased by 14% the combined software and hardware prices of its PDP-8, 11, 12, 14 and 15 minis.

Despite these price increases, the demand for small-size computers is increasing and sales in this market category have grown over the last several months, the report said.

NCR plans to nearly double its production facility in Oiso, Kanagawa Prefecture. Takachiho-Burroughs received $25 million in orders for L series computers during the period from November 1973 to March 1974, the report said.

EDP Japan Report suggested this increase in sales may also be due to labor shortage problems.

In addition to these price hikes, some movement toward unbundling is apparent. The report cautioned "unbundling is being used in a narrower sense in Japan than elsewhere."

Unbundling pricing systems are applied only to some particular models of very small computers, according to the report.

Warranty Term Shortened

"In some cases, this simply means that the normal one-year warranty term is to be shortened to several months, or the extent of free customer-education services limited to some particular cases," the report said.

But, the report claimed, "it is still very difficult to apply an unbundling policy to Japanese users."

"Every domestic computer maker has a strong desire to raise prices of medium to large-scale computers in order to absorb increasing costs of labor, materials and energy," the newsletter concluded. But no manufacturer will make a move until IBM takes a step toward a price increase in Japan, a Fujitsu representative was quoted as saying.

The report indicated industrial sources estimate IBM will announce a revised price policy before long, with an average price increase for the 370, System/3 and System/7 of 3% to 9%.

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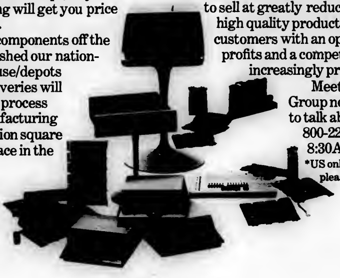

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CAI Diversifies With DOS, Tester, LSI/1

By Molly Upton
Of the CW Staff

IRVINE, Calif. – Although classified by many solely as a maker of low-cost iron, Computer Automation, Inc. (CAI), the Naked Mini company, is quietly proceeding to destroy that myth.

The firm plans to announce its already delivered disk operating system, which begins at $25,900. For about $28,000, CAI offers an entire system based on a 32K LSI Type 2 mini with 2.46M words of disk and assorted peripherals.

"We have deliberately positioned ourselves in the market as a supplier of low-end, high-volume, reliable products," President David Methvin noted.

However, he explained, the firm does much of its business in the $2,000 to $10,000 per unit range. Less than 5% of CAI's revenues come from computers that sell for under $2,000, he said. Units selling for between $2,000 and $4,000 comprise about 35% to 40% of its business, and the same percentage comes from sales of units over $4,000. Methvin projected CAI revenues should reach between $19.5 million and $20 million this year.

Next year, the total market for computers selling for under $4,000 will be somewhere between $200 million, Methvin estimated.


Undelivered LSI/1 and Its Seven Processor Chips

The DOS system will enlarge CAI's domain in the end-user market, which previously has been occupied solely by activities of its new Industrial Products Division, which markets CAI's "Capable" tester.

The OEM sales force will handle the DOS sales, he explained, for the foreseeable future.

The CAI tester was developed for in-house use testing boards and was treated as "something of a stepchild" until it began bringing in close to $1 million in revenue per year.

Now the firm has assigned a separate division to market the unit, which Methvin said pays for itself in nine to 12 months, although it carries a price tag ranging from $30,000 to $500,000.

As evidenced by the emergence of the DOS unit, CAI has considerable software capability, and Methvin reeled off a list of software products such as cross assembler, real-time executive and advanced Basic. The firm also has a staff of applications programmers.

Shipments of the LSI/2 mini, which has separate processor and memory boards, are proceeding at the rate of about 1,000 per quarter, Methvin said, and the firm has already shipped about 1,000.

'Egg on Our Face'

However, the LSI/1 is a different story. The machine is designed around seven custom MOS processor chips, with memory on the same board. "It's frustrating. We have egg on our face," Methvin said.

The problem lies in the design of the processor chips, which Methvin insists should be interchangeable to avoid stocking and maintenance problems.

He said he's reluctant to come up with a new date when the

(Continued on Page 37)


CW Photos by M Upton
Methvin


CAI's Disk Operating System


Dave Jackson checks out Type 2 board with Capable tester.

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Kilpatrick Claims IBM Oligopolistic In Disk, Mainframe Price Manipulation

CW Photo by M.Upton

Kilpatrick

IRVINE, Calif. – IBM was careful to preserve the existing oligopoly of mainframe makers when it selectively cut prices on disks by bringing out the 2319, observed Lester L. Kilpatrick, president of California Computer Products, Inc.

The independents have learned IBM might tolerate losing 15% to 20% of its base, but won't tolerate a negative shipping rate, he said.

In Kilpatrick's view, when IBM discovered it was taking back more disk drives than it was shipping, it decided to counter the growing independent base by a lower-cost 2319, integrating more functions in controllers and introducing the fixed- and extended-term plans.

By cutting disk prices alone, IBM could have reduced total system prices, which would have meant imperiling the base of other mainframe makers, Kilpatrick added.

With 70% of the market, IBM is under sufficient scrutiny from the Justice Department and needs some competition, he said.

So IBM countered by raising mainframe prices, thus preserving the status-quo of system costs, Kilpatrick said.

But to compete fairly, IBM should have priced all products with the same terms and conditions, and with the same percentage margins, Kilpatrick charged.

If it cut prices, it should have cut them by the same calibrated amounts, rather than selectively altering conditions, bundling equipment design and coming out with the same product under two names and different prices, as it did with the 2319, he said.

Correction

California Computer Products has developed the Model 1035 [CW, July 10], which is compatible with IBM's 3330 double-density disk drive. Deliveries are scheduled for January 1975.

Center Monitors Battlefield Conditions

By Vic Farmer
Of the CW Staff

BURLINGTON, Mass. – It's getting so that when the U.S. Air Force and U.S. Marines want to go out and play war they need their own portable tactical data center.

For $12 million, RCA Government Communications and Automated Systems put together two portable computer centers here to store, retrieve, update and generate information for field commanders in combat situations.

The central computer is the old stand-by AN/UYK-7 designed several years ago by Univac and said to be roughly comparable to a Univac 1108 in operating characteristics.

Tied to the AN/UYK-7 are three Rolm minicomputers (ruggedized Data General-type Novas). One of the Rolm minis serves as a standard communications front end which controls 17 Lenkurt communications modems that can be connected to remote teletypewriters. These lines are used mostly for data input.

Another mini is used to control or multiplex the standard low-speed peripherals at the central CPU such as a 290 line/min (80-column) printer from Data Products, a Xynetics 37 in. by 53 in. four-color plotter (which was modified to plot vertically), a Cook paper tape reader, Tally paper tape punch and Motorola 4,000-character CRT display.

The third minicomputer controls several more Motorola CRT displays which are used to present tactical information.

Operators at these terminals compare and analyze data and relay the information in response to telephone queries.

Attached to the main CPU are 2.5 billion bits of disk capacity in the form of ruggedized Control Data IBM 2314-type 11-high disk drives. Tape drives are 800 bit/in., 75 in./sec Potter units, and there is an RCA fast access drum and a GI magnehead fixed-head disk drive. RCA designed and built most of the interfaces.

System Development Corp. was the prime contractor and handled the software and systems engineering design. The total bill for these two portable DP centers is $40 million. These centers are part of the Tactical Information Processing and Interpretation (Tipi) system that will be used for the support of air and ground forces in combat after 1976, according to a military spokesman.

CAI Diversifies With DOS, Tester

(Continued from Page 36)

chips will be ready. "It could be six months."

But CAI hasn't lost any orders because of the delay, he noted, adding that since the LSI/2 is compatible, customers are taking them instead, in some instances.

CAI does not sell its processors separately from memories, as memories contribute to the overall system profitability. In fact, CAI has designed a device that blows the memory about every 20 minutes if foreign memories are installed or added on, he said.

And, he added, if someone copies CAI's device in order to make foreign memories acceptable, he's infringing on a CAI patent.

CAI has doubled its sales force within the last six months, said Jim Siehl, vice-president of sales.

A year ago international sales accounted for 10% of revenues and now are between 22% to 25% of revenues, he added.

Siehl said he hasn't seen any indications firms are cutting their capital spending, adding he is reasonably bullish about '75.

Time for Sale

COSTA MESA, Calif. – Companies have run the gamut of promotional gimmicks from pencils to T-shirts, and now computer industry firms can order custom watches.

The manufacturer, Designs in Time, Inc., said it will apply any type of photo, logo type or message in full color to the face of a watch.

Wema Seminar Examines Privacy Impact

LOS ANGELES – A day-long seminar to examine the industry impact of proposed privacy legislation will be presented by the Western Electronic Manufacturers Association (Wema) Friday, July 19 at the Marriott Hotel here.

The seminar, organized by Wema because "too little was being done to make industry aware of the ramifications of the proposed privacy laws," will feature Rep. Barry M. Goldwater Jr. (R-Calif.) who is sponsor of "The Right to Privacy Act" (H.R. 14163)

Other participants include:

Dr. Willis Ware of the Rand Corp., chairman of the U.S. Department of Health, Education and Welfare Committee on Automated Personal Data Systems, who will discuss the committee's recommendations; attorneys William A. Fenwick and Edward R. Hearn who will evaluate the impact of proposed legislation on computer users; and James A. Case, president of Dylakor Computer Systems, Inc., who will discuss the requirements the legislation would impose upon computer manufacturers.

"One of Wema's principal concerns is that the legislation does not distinguish between computer files which are used in-house for the exclusive use of the employer, and credit or other files which are developed for the purpose of commercial distribution and sale," said Eben S. Tisdale, Wema vice-president.

Compliance would be extremely costly for companies utilizing computerized personnel files, and in many cases would not significantly protect the right of privacy, he added.

The seminar is open to the public. Registrants should contact the association's offices in Los Angeles or Palo Alto.

Adds Contracts Total $2 Million

HAUPPAUGE, N.Y. – Applied Digital Data Systems (Adds) has received two contracts for its CRT terminals valued at over $2 million from Modular Computer Systems (Modcomp) and Microdata Corp.

Modcomp's contract calls for delivery of 1,000 terminals during the next two years of models ranging from the Consul 580 to the Consul 980. The order is valued at about $1.6 million.

Microdata's order, valued at $500,000, is for Consul 580 terminals for its Reality minicomputers business system. Adds supplied Consul 580 terminals for initial shipments of the Reality system.

Other Contracts

Computer Optics, Inc. has landed an OEM contract estimated at $10 million from Control Data Corp. for CO:77 information display systems, plug-compatible replacements for IBM 3270 systems.

Delta Data Systems Corp. has received a contract from Tal-Star Computer Systems, Inc. for Series 5000 video display terminals which will be incorporated in Tal-Star's automated text editing/typesetting systems.

Wangco, Inc. has received a contract from Autologic, Inc. to supply its Mod 10 tape drive for inclusion in the Autologic APS-4 CRT phototypesetting system.

Scientific-Atlanta, Inc. has been awarded a contract by Comsat General Corp. for shipboard antennas and associated terminal equipment as part of a major program to provide improved communications via satellites to commercial ships at sea.

Hazeltine Corp. has signed a rental agreement with Remote Computing Corp. for the lease of 250 Hazeltine 2000 video display terminals.

CMC Sets Sales To Leasing Firms

MARINA DEL RAY, Calif. – Computer Machinery Corp. (CMC) has arranged for the sale of $10 million of equipment to Transamerica Computer Corp. during the next year. This transaction is not related to a finalized agreement by which CMC will lease 300 remote batch Remcom systems owned by Transamerica as part of its takeover of the Remcom base.

In addition, CMC completed the sale to Inleasing Co. of $5.5 million of equipment which it will lease back. This was part of the previous agreement with Inleasing under which CMC leased about 150 Remcom systems.

"The arrangements with Transamerica and Inleasing, together with planned European financing, will meet our cash flow requirements for the next twelve months," commented President Thomas L. Ringer.

Expansions

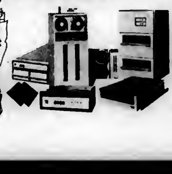
Storage Technology Corp. plans to construct a third building at its Louisville, Colo., headquarters. The 60,000 sq-ft building, which will house administrative and marketing functions, will bring the Louisville facilities' total area to more than 170,000 sq ft.

Hewlett-Packard Co. has agreed to purchase 145 acres of property adjacent to Corvallis, Ore. for its Advanced Products Division, which makes pocket-size calculators.

Data General Corp. has leased space in three buildings, totaling 87,000 sq ft, to be used for software development, a field service department and the Northeast sales office. The buildings are in Westboro and Southboro, Mass.

Cambridge Memories, Inc. has moved to new headquarters at the Bedford Research Park, consolidating manufacturing, engineering, administration, finance and marketing activities. CMI is now at 12 Crosby Drive, Bedford, Mass. 01730.

Systematics, Inc. has opened a data processing center in Phoenix.



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056	087	408	557
077	088	514	602
082	089	519	604

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Specifications are on file and may be examined at the office of the Waltham Housing Authority, 110 Pond Street, Waltham, Mass.

No bid shall be withdrawn for a period of thirty days subsequent to the opening of the bids without the consent of the Waltham Housing Authority.

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By William E. Costello, Chairman

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[illegible] President

NOTICE INVITING PROPOSALS FOR FURNISHING, DELIVERING AND INSTALLING COMPUTER SYSTEM AND PERIPHERAL HARDWARE

NOTICE IS HEREBY GIVEN THAT THE CITY CLERK, CITY OF INGLEWOOD, CALIFORNIA, will receive sealed proposals up to the hour of 11:00 a.m. effective time, on August 5, 1974 for furnishing and delivering to said City the equipment or product specified.

Each proposal must be enclosed, together with required security, in a sealed envelope, provided for the purpose and plainly marked on the outside with description, date and time of opening, and such shall be mailed or delivered so as to be in the hands of the City Clerk's office, One Manchester, Inglewood, California 90301, on or before the hour above stated, at which time, in the City Hall of said City, all proposals received will be publicly opened and declared by the City Clerk and the Purchasing Officer of said City.

Each proposal must be accompanied by cash, a cashier's or certified check payable to the City of Inglewood, or a bid bond, for an amount of not less than ten percent (10%) of the aggregate of the proposal, as a guarantee that the vendor will fully comply with the requirements of the specifications.

The Council reserves the right to reject any or all proposals and to waive any informality in any proposal and to take all proposals received under advisement for a period not exceeding thirty (30) days from and after the date upon which such proposal is opened and declared.

Specifications are on file in the office of the City Clerk and documents can be obtained from the Purchasing Supervisor, One Manchester Boulevard, Inglewood, California 90301.

Dated at Inglewood, California this 18th day of June 1974.

DOUGLAS W. AYRES
CITY ADMINISTRATOR
CITY OF INGLEWOOD
CALIFORNIA

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240K, 3330 (4m), 2314 (8m), 6 3420-5 d.d. tepe

370/135
144K, 2314 (8m), 6 3420-6 d.d. tepe

360/40
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360/30
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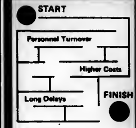

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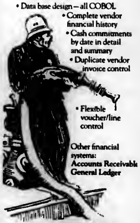

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SEC Approves Consolidated Ticker Tape

By a CW Staff Writer

CHICAGO – Plans to create a consolidated ticker tape that will provide final sale prices on stock transactions listed with all exchanges have been approved by the Securities and Exchange Commission (SEC).

Expected to begin operation in February 1975, the tape will be managed by an association of several major stock exchanges and the National Association of Securities Dealers and will actually consist of two tapes.

Consolidated Tape Association (CTA) will use a market data services system based on an IBM 360/50 to report instantly the prices of stocks everywhere, said a spokesman for the New York Stock Exchange, a member of the association. Participating exchanges will send trading information to the central computer through terminals.

"At present, each exchange has its own tape," the spokesman commented. "By next year, someone buying or selling stock XYZ, for example, will consult one of the two consolidated tapes to find that the price of the stock is $30 a share in New York, but sells for $30.25 on the Pacific exchange," he said.

One tape, designated "Network A," will carry the last transactions made on the New York Stock Exchange (NYSE), in addition to trades of all those stocks carried by NYSE and duplicated on other exchange lists. For example, Texaco, listed on both the NYSE and the Pacific exchange, would appear on this tape.

Amex Listings

"Network B" will provide the final sale price for the basic American Stock Exchange listings no matter where they appear. The spokesman said this tape will also carry all stocks listed only on regional exchanges.

An organizational meeting held in Chicago at the end of June included the New York, American, Midwest, Pacific and Philadelphia, Baltimore and Washington (PBW) exchanges, in addition to the National Association of Securities Dealers.

All Exchanges

Ideally, the system will eventually involve every exchange, he noted. CTA initiated its efforts to include all exchanges by inviting observers from the Boston and Detroit stock exchanges to its meeting.

The service will also be available to member firms and to newspapers for fees still under discussion, the spokesman said.

Mohawk Posts $14.9 Million Loss; Revenues Rise to $168.7 Million

UTICA, N.Y. – Mohawk Data Sciences Corp. (MDS) posted a loss of almost $14.9 million for the year ended April 30 compared with a loss of $431,000 in 1973. Revenues, however, rose to $168.7 million from $143.2 million a year earlier.

The loss for the year includes nonrecurring charges of $1.2 million in the fourth quarter resulting from shutting down plants in the U.S. and Britain, and reducing manufacturing operations in West Germany.

In addition, the firm wrote off $3.6 million in goodwill and $1.7 million in deferred costs relating to estimated future tax benefits.

MDS also suffered a $1.1 million loss in the fourth quarter from currency translation and was adversely affected by high interest rates, the firm said.

Executives Switch

Mohawk's top executives have changed chairs, with V.E. Johnson resuming the presidency and vacating the chairmanship; former president Richard Rifenburgh becomes chairman.

As chief executive, Johnson will have a "mandate to take day-to-day operational control of the company and realign it to the unsettled condition in today's business environment."

Pansophic Sales Leap; Profits Spurt 190%

OAK BROOK, Ill. – Pansophic Systems, Inc.'s sales doubled for the second consecutive year, while earnings more than doubled.

Earnings for the year rose to $361,810 or $1.56 a share compared with $114,168 or 82 cents a share in 1973.

Revenues climbed to $2.9 million from $1.2 million a year ago.

Support Expenses Rise

"Although our gross sales were up 230% over 1973, profits were up only 190%. The great difference lies in the fact that our expenses for product information and product support tripled for 1974," said President Joseph A. Piscopo.

"We have spent more for development of enhancements to our products than ever before . . . a trend that will be a standard practice for the future," he added.

Pansophic sells packaged software.

Earnings Reports

MOHAWK DATA SCIENCES
Year Ended April 30

	1974 (000)	e1973 (000)
Revenua	$168,701	$143,216
Tax Cred	.....	195
Spec Chg	.....	b122
Loss	d14,884	431

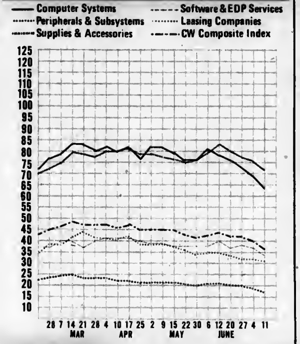
a-Includes results of operetions, from the data of acquisition, of Elastolabs Corp. and Computing Efficiency, Inc., acquired Jen. 12, 1973 and March 5, 1973, respectively. b-Represents a net loss incurred on sale of the company's unoccupied facility in Stoneham, Mass. d-Includes charges of about $6.4 million of nonrecurring items relating to plent closings and write-offs of goodwill end future tax benefits. The company notas that 1974 results were adversely effacted by currency transletion losses of $1.1 million that occurred in tha fourth quarter.

INTEL
Six Months Ended Juna 30

	1974	1973
Shr Ernd	$1.99	a$.40
Revanue	68,709,000	23,544,000
Earnings	13,304,000	2,562,000

a-Adjusted for three-for-two stock split in May 1974.

COMPUTERWORLD Computer Stocks Trading Indexes



DATA CARD
Year Ended March 30

	1974	1973
Shr Ernd	$.51	$.28
Revenua	6,242,700	4,832,353
Disc Op	.....	(84,956)
Earnings	749,637	417,722

STANDARD MICROSYSTEMS
Three Months Ended May 31

	1974	1973
Ravenua	$1,088,305	$543,735
Loss	26,198	807,747

CAMBRIDGE MEMORIES
Three Months Ended June 1

	1974	1973
Shr Ernd	$.19	$.13
Revenue	8,056,332	3,605,583
Earnings	321,098	167,194
9 Mo Shr	.52	.33
Revenua	16,552,111	8,271,910
Tex Cred	.....	82,880
Eernings	747,878	425,882

MEASUREX
Three Months Endad May 31

	1974	1973
Shr Ernd	$.32	$.22
Revenue	9,413,000	6,065,000
Eernings	983,000	598,000
6 Mo Shr	.59	.43
Revanua	18,231,000	11,218,000
Eernings	1,725,000	1,162,000

DECISION DATA COMPUTER
Three Months Ended June 1

	1974	1973
Shr Ernd	$.07	.....
Revenua	9,932,000	3,929,000
Tax Cred	128,000	.....
Eernings	270,000	(288,000)
6 Mo Shr	.11	.....
Revenue	17,168,000	7,303,000
Tex Cred	194,000	.....
Earnings	411,000	(682,000)

INCOTERM
Three Months Ended Mey 25

	1974	1973
Shr Ernd	.....	$.29
Revanua	2,851,000	3,597,000
Tax Cred	.....	149,000
Eernings	(786,000)	473,000

DATA DIMENSIONS
Three Months Ended Merch 31

	1974	1973
Shr Ernd	$.13	$.04
Revenue	942,200	a887,400
Tex Cred	48,000	8,000
Earnings	101,200	30,200

a-Includes $97,000 fee for cancellation of a date processing services contract, which would hava expired Dec. 31, 1974.

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

F X C N		RRICE 1P73-74 PANGE (1)	CLOSF JUL 11 1P74	WEEK NFT CHNGE	WEEK PCT CNNGE
	CONPUTEP SYSTENS				
N	PUPPOUGHS COPP	4P-126	AP 7/A	-9	-9.1
N	COLLINS PADIO	16- 26	24 3/4	0	0.0
O	COMPUTER AUTOMATION	5- 20	P 3/8	-1	-9.6
N	CONTPOL DATA COPP	20- 62	1P 1/P	-2 1/4	-10.3
N	DATA GENERAL CORP	26- 4P	27 5/P	-2 3/4	-P.0
O	DATAPOINT COPP	P- 21	9 1/4	-1	-P.7
O	DIGITAL CONP CONTROL	2- 6	1 7/P	- 1/2	-21.0
N	DIGITAL EQUIPNENT	73-121	P5	-2 3/R	-2.4
N	ELECTPONIC ASSOC.	2- 9	2	0	0.0
4	ELECTPONIC ENGINEEP.	6- 14	6 7/P	- 5/P	-8.3
N	FOXPOPO	23- 4A	26	-1 3/8	-5.0
O	GENEPAL AUTOMATION	2P- 55	29 1/4	-5 1/4	-15.2
O	GRI COMPUTEP CORP	1- 3	3/4	0	0.0
N	HEWLETT-PACKAPD CO	70- 99	74 1/P	-5	-6.2
N	HONEYWELL INC	55-139	54 3/4	- 3/4	-1.3
N	IBM	19A-340	19A 3/4	-11 1/4	-5.3
O	INTEPDATA INC	7- 2P	13 1/4	- 1/4	-1.A
O	NICPODATA COPP	2- 10	3 3/A	- 1/4	-6.A
N	NCP	27- 46	2A 1/2	-2 3/8	-7.6
N	RAYTHEON CO	2P- 39	27	-2 5/8	-8.A
N	SINDEP CO	29- 74	2A 3/4	- 3/4	-2.5
N	SPEPPY PAND	34- 56	33 3/4	-3 3/4	-10.0
A	SYSTEMS ENG. LABS	1- 9	1 1/4	- 3/0	-23.0
N	TEXAS INSTPUMENTS	A3-13P	P4 1/A	-9 1/8	-9.7
O	ULTIMACC SYSTEMS INC	1- 11	1 3/4	+ 1/4	+16.6
N	VAPIAN ASSOCIATES	7- 20	7	-1	-12.5
N	WANG LABS.	10- 34	10 1/9	-1 1/4	-10.9
N	XEPOX COPP	100-169	101 5/9	-7 3/4	-7.0
	LEASING CONPANIES				
A	ANOTHE COMPUTEP	1- 5	1 1/9	0	0.0
O	PPESNAHAN COMP.	1- 2	2 1/0	0	0.0
O	COMDISCO INC	2- 17	3 1/4	- 1/4	-7.1
4	COMMEPCE GROUP COPP	3- 6	2 7/A	- 1/2	-14.A
O	COMPUTER EXCHANGE	1- 1	1/P	0	0.0
4	COMPUTER INVSTRS GPP	1- A	1 1/4	0	0.0
O	CONP. INSTALLATIONS	1- 2	1	0	0.0
M	DATRONIC PENTAL	1- 3	7/P	0	0.0
4	DCL INC	0- 3	3/A	0	0.0
N	DPF INC	3- P	2 3/4	- 3/8	-12.0
O	EDP RESOUPCES	1- 3	3 1/4	0	0.0
●	GPANITE MGT	1- 6	2	0	0.0
4	GPEYHOUND COMPUTER	3- 6	3 3/A	0	0.0
4	ITEL	4- 12	3 1/2	- 1/2	-12.5
N	LEASCO CORP	A- 1A	8 1/2	- 1/2	-5.5
O	LEASPAC COPP	1- 9	1	- 1/4	-20.0
O	LECTNO NGT INC	1- 2	1/4	0	0.0
O	NPB INC	2- 15	2 3/A	- 1/P	-5.0
4	PIONEER TEX COPP	2- 10	2 5/A	- 1/4	-P.6
4	POCKWOOD COMPUTEP	1- 3	5/P	- 1/8	-16.6
N	U.S. LEASING	1t- 36	10 1/2	-1 1/2	-12.5

EXCH: N=NEW YORK; A=AMEPICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTEP
O-T-C PPICES APE PID PRICES AS OF 3 P.M. OR LAST RID
(1) TO NEAPEST DOLLAP

F X C H		PRICE 1P73-74 RANGE (1)	CLOSE JUL 11 1P74	WEEK NET CHNGE	WEEK PCT CNNGE
	SOFTWAPE & EDP SEPVICES				
O	ADVANCED CONP TECH	1- 2	1	0	0.0
4	APPLIED DATA RES.	2- 4	1 7/A	- 1/8	-6.2
O	APPLIED LOGIC	1- 3	1/P	0	0.0
N	AUTOMATIC DATA PROC	21- P4	21	-2 3/4	-11.5
O	BPANDON APPLIED SYST	1- 1	1/2	0	0.0
O	CENTPAL DATA SYSTENS	3- P	4 1/4	0	0.0
O	COMPUTER DIMENSIONS	1- 5	1 1/2	- 1/4	-14.2
O	COMPUTEP HORIZONS	1- 6	1 1/2	- 1/4	-14.2
O	CONPUTEP NETWOPK	1- 5	1	- 1/2	-33.3
N	COMPUTEP SCIENCES	2- 6	2 1/2	- 1/4	-P.0
O	COMPUTEP TASK GPOUP	1- P	1/2	0	0.0
O	COMPUTEP TECHNOLOGY	1- 3	1/2	0	0.0
O	COMPUTER USAGE	2- P	2 3/P	- 3/8	-13.6
O	COMPESS	1- 2	1/4	- 1/8	-33.3
O	COMSHAPE	2- P	2 3/4	0	0.0
N	COPOUPA CORP	2- 15	2 1/P	0	0.0
O	DATATAP	1- 4	1 5/P	+ 1/8	+8.3
A	ELECT CONP PROD	1- 2	1/A	- 1/8	-50.0
N	ELECTRONIC DATA SYS.	12- 56	13 3/9	- 7/0	-6.1
O	INFONATIONAL INC	1- 2	1/2	0	0.0
O	I.D.A. DATA COPP	1- 1	3/P	0	0.0
O	IPS CONPUTEP MAPKET.	1- 5	3/4	0	0.0
O	KEANE ASSOCIATES	2- 5	2 3/4	- 1/2	-15.3
O	KEYDATA COPP	2- 12	1 7/8	- 1/4	-11.7
O	LOGICON	2- 7	3 1/8	0	0.0
A	MANAGEMENT DATA	1- 5	1 3/A	- 1/4	-15.3
O	NATIONAL CSS INC	14- 42	16	+1	+6.6
O	NATIONAL CONPUTEP CO	1- 1	1/4	0	0.0
O	NATIONAL INFO SPVCS.	1- 2	1/A	0	0.0
A	ON LINE SYSTENS INC	12- 31	23	-2	-P.0
N	PLANNING PESEAPCH	2- 7	2 1/0	- 3/8	-15.0
O	PROGRAMMING METHODS	17- 25	17	0	0.0
O	PPOGRAMMING & SYS	1- 1	3/4	0	0.0
O	RAPIDATA INC	2- 24	2 3/P	- 1/4	-P.5
O	SCIENTIFIC COMPUTEPS	1- 3	5/A	- 1/8	-16.6
O	SIMPLICITY COMPUTEP	1- 4	3/4	0	0.0
O	TCC INC	1- 1	1/4	0	0.0
O	TYMSHAPE INC	6- 13	A 1/2	- 1/8	-1.4
O	UNITED DATA CENTEP	2- 6	2	- 3/4	-27.2
4	UPS SYSTEMS	2- 8	1 7/0	- 1/4	-11.7
M	NYLY COPP	3- 11	2 3/4	- 1/4	-8.3
	PERIPHEPALS & SUBSYSTEMS				
N	ADDRESSOGPAPH-MULT	5- 34	4 5/A	0	0.0
O	ADVANCED MEMORY SYS	3- 23	2 1/2	- 1/2	-16.6
N	AMPEX CORP	3- 7	3	0	0.0
O	ANDEPSON JACOBSON	2- 6	2 1/4	- 1/P	-10.0
O	BEEHIVE MEDICAL ELEC	3- 10	2 3/4	- 1/2	-15.3
4	BOLT,BEPANEK & NEN	6- 12	6 7/A	- 1/8	-1.7
N	BUNKEP-PAMO	5- 18	5 1/4	- 3/8	-6.6
A	CALCOMP	5- 16	7 1/4	- 1/8	-1.6
O	CAMBRIDGE MEMOPIES	7- 17	7 1/4	0	0.0
O	CENTPONICS DATA COMP	13- 3P	13 3/4	-1 1/2	-9.A
O	CODEX COPP	9- 1P	8 1/4	-3	-26.6
O	COPNITRONICS	1- 3	7/8	- 1/4	-22.2

F X C N		RRICE 1973-74 PANGF (1)	CLOSF JUL 11 1974	NEEK NFT CHNGF	WEEK RCT CNNGF
O	COMPUTEP CONMUN.	1- 4	5/9	0	0.0
4	COMPUTEP EQUIPMENT	1- 3	1 1/4	- 1/A	-P.0
O	COMPUTER MACHINERY	2- 13	2 3/A	- 1/2	-17.3
O	COMPUTER TPANSCEIVER	1- 6	1 1/4	0	0.0
N	CONRAC COR?	13- 3P	12 3/4	-1 3/8	-P.7
O	DATA ACCESS SYSTENS	1- 3	2 1/2	0	0.0
O	DATA 100	7- 1P	6 7/9	- 7/A	-11.2
A	DATA PRODUCTS COPP	2- 5	2 7/A	- 1/4	-A.0
O	DATA PECOGNITION	1- 3	1/4	0	0.0
O	DATA TECHNOLOGY	1- 5	2 1/4	+ 1/2	-1A.1
O	DECISION DATA COMPUT	4- 40	4 3/4	- 1/4	-5.0
O	DELTA DATA SYSTEMS	1- 1	1/P	- 1/A	-20.0
O	DI/AN CONTROLS	1- 4	1/P	0	0.0
N	ELECTPONIC M & M	2- 6	2	- 1/A	-5.A
O	FABRI-TEK	2- 5	1 5/A	- 1/4	-13.3
O	GENERAL COMPUTEP SYS	2- 9	2	- 1/4	-11.1
N	GENERAL ELECTRIC	45- 76	44 7/P	-2 1/2	-5.2
N	HAZELTINE CORP	4- P	4	- 1/4	-5.A
O	INFOREX INC	2- 23	2 7/9	0	0.0
O	INFOPMATION DISPLAYS	1- 2	1/4	0	0.0
O	INFORMATION INTL INC	A- 15	A 1/P	-1 1/P	-15.0
A	LUNDY ELECTRONICS	3- 9	2 7/A	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/4	0	0.0
N	MEMOREX	2- 19	4	0	0.0
A	MILGO ELECTPONICS	9- 2A	10	- 3/4	-6.9
N	MOHAWK DATA SCI	2- 13	1 7/9	- 1/4	-11.7
O	DDEC COMPUTER SYST.	2- 6	1 1/P	0	0.0
O	OPTICAL SCANNING	2- 9	3 1/P	0	0.0
O	PEPTEC CORP	3- 9	2 7/A	+ 1/4	+P.5
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTPUMENT	2- P	2 5/9	- 1/A	-4.5
O	PPECISION INST.	2- 6	1 1/4	0	0.0
O	QUANTOR COPP	4- 10	3 1/P	- 1/4	-6.6
O	PECOGNITION EQUIP	2- P	2 1/2	- 1/2	-16.6
N	SANDERS ASSOCIATES	3- 1P	3 1/P	- 1/A	-3.4
O	SCAN DATA	1- 6	1 1/4	0	0.0
O	STORAGE TECHNOLOGY	9- 34	P 1/9	-1 1/4	-12.0
O	SYCOP INC	7- 20	7	-1	-12.5
O	TALLY COPP.	2- 14	2 1/A	- 1/4	-10.5
O	TEC INC	4- 9	3 1/P	0	0.0
N	TEKTRONIX INC	30- 55	37	+ 7/8	+2.4
N	TELEX	3- A	2 5/A	+ 1/P	+5.0
O	WANGCO INC	7- 13	7 3/9	- 1/4	-3.2
O	WILTEK INC	4- 19	3 3/4	- 3/4	-16.6
	SUPPLIES & ACCESSORIES				
O	BALTIMOPE BUS FORMS	4- P	A 1/4	+ 1/4	+6.2
A	BAPPY WRIGHT	9- 13	5	+ 1/8	+2.5
O	CYBEPMATICS INC	1- 3	1 1/4	0	0.0
A	DATA DOCUMENTS	17- 54	42 1/4	-6 1/4	-12.A
O	DUPLEX PPODUCTS INC	6- 17	13	-1 7/0	-12.6
N	ENNIS BUS. FORMS	5- 9	5 1/P	- 3/8	-6.3
O	GPAHAM MAGNETICS	6- 20	6 1/2	- 1/4	-3.7
O	GRAPHIC CONTPOLS	7- 1P	P 3/4	0	0.0
N	3M COMPANY	60- P1	69 1/2	- 7/P	-1.2
O	MOORE COPP LTD	49- 65	4P 1/2	-1 1/2	-3.0
N	NASHUA CORP	32- 5A	35 7/9	-1 7/0	-4.P
O	PEYNOLDS & REYNOLD	17- 51	16 1/2	-5 1/2	-25.0
O	STANDAPD REGISTEP	11- 20	13 1/4	-1 1/2	-10.1
O	TAB PRODUCTS CO	6- 23	5 3/4	0	0.0
N	UARCO	15- 23	1P	-1 1/4	-6.1
4	WABASH MAGNETICS	5- P	4 5/A	- 3/P	-7.5
N	WALLACE BUS FORMS	14- 26	1P 3/9	-1 1/P	-5.4

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